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EXECUTIVE SUMMARY & INDUSTRY OVERVIEW
NUEXCO REPORT 156

Downward pressure on the market continued this month as evident by the **Exchange Value** decline to $23.50 per pound U_3O_8 from $24.25 per pound U_3O_8 the previous month. Seller competition for the limited buyer interest has been apparent and substantial quantities of material are being offered at about the level of this month's Exchange Value.

Holders of inventory now represent two-thirds of the sellers with available near-term material, an increase over the previous month. Active inquiries to sell in the spot and near-term market remained fairly stable and amount to about 5.4 million pounds U_3O_8. Uranium in the form of UF_6 continues to make up a large percentage of the available material, thus creating demand for swaps and deconversions in order to respond to requests for U_3O_8. Total of inquiries to purchase in the spot and near-term market increased slightly to 1.4 million pounds.

Three uranium transactions are reported this month. The total of material involved is approximately one million pounds. The **Transaction Value** decreased slightly to $24.40 per pound U_3O_8. Ten transactions qualified in this month's calculation. As buyers and sellers alike investigate marketing strategies given the current market decline and high cost of money, interest continues in the loan market. The **Loan Use Charge Rate** remained at the previous month's level of 5½ percent.

The **Conversion Value** held constant for the third straight month at $1.15 per pound U. Two secondary market transactions for conversion services closed this month involving approximately two million pounds U of conversion services. The Conversion Value reflects individual utility requirements and financial considerations when considering entering the near-term secondary market for conversion services. Advantages of the deconversion swap are covered in this Report.

President Reagan recently issued a policy statement on nuclear proliferation which is intended to give direction to the US nuclear power program and also to those involved in negotiating US nuclear bilateral agreements. A look at nuclear policy and an update on safeguards agreements of the US, Australia and Canada are covered in this month's *Essay*.

This month's *Topical Essay* continues the discussion on unconventional transactions with a look at the option as a strategic tool.

An in-depth look at Spain's nuclear program including uranium reserves is begun in this month's *Raw Materials* essay.

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SEPTEMBER 1981 NUMBER 157

Monthly Report on the Uranium Market

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MONTHLY REPORT ON THE URANIUM MARKET

September 1981 No. 157

JAMES F. VAUGHAN, *EDITOR* TERESA T. FLMS, *ASSOCIATE EDITOR*

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FORWARD

We are pleased to announce that Mrs. France Millet Hamilton has joined Nuexco as representative for Nuexcoeurope-Atlantic. She will represent Nuexco in the United Kingdom, France, Spain and Portugal. She was educated in the United Kingdom and graduated in Economics from St. Andrews and Cambridge Universities. Since 1967 France has held various posts in the nuclear industry. In London she was associated with the United Kingdom Atomic Energy Authority and Rio Tinto-Zinc Corp. Ltd. She also spent several years in Paris with Framatome. Her experience has covered uranium marketing, procurement and sales contracts.

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URANIUM MARKET

AUSTRALIA

Movement towards mine and mill completion is continuing at Energy Resources of Australia's (ERA) Ranger complex. Full-scale production is scheduled to begin in October 1981 and regular concentrate shipments will likely commence in November or December. A settlement with the Seamen's and the Waterside Workers' Unions is needed within the next few months to insure unhindered shipments. Currently the two unions are refusing to handle uranium-carrying vessels at the ports of Darwin, Brisbane and Sydney.

Denison Mines of Canada Ltd. must conclude satisfactory agreements with the Northern Land Council (NLC) and local aboriginal land owners before its Koongarra project can achieve development status. The NLC terminated negotiations with Denison three months ago and has concentrated its attention on Pancontinental Mining Ltd.'s Jabiluka project. There are no indications of when discussions with Denison will be resumed.

CANADA

Under the 1961 Mineral Disposition Regulations of the province of Saskatchewan, all uranium or other minerals extracted from uranium ore obtained from Saskatchewan Crown lands are subject to that province's royalty system. The method of calculation and payment of royalties in respect to this uranium was set forth by the province's Department of Mineral Resources in 1977. Since Saskatchewan mining operations are approaching production start-up, a look at the method of calculating the royalty owed may be of interest.

The Saskatchewan royalty system applies to a single mine complex and has two components, a basic royalty and a graduated royalty. The basic royalty is fairly straightforward and requires payment of three percent of the gross value of sales for a given year. The graduated royalty is more complex and is calculated as a percentage based on a profitability ratio (operating profit to capital investment). Determination of the operating profit and capital investment components will be discussed later.

The following royalty table determines the amount of graduated royalty due:

Table 1

DETERMINATION OF SASKATCHEWAN GRADUATED ROYALTY

Profitability Ratio (Operating Profit to Capital Investment)	Graduated Royalty Payable
Below 15 percent	None
On that portion above 15 percent but below 25 percent	15 percent of operating profit in this bracket
On that portion above 25 percent but below 45 percent	Amount in previous bracket plus 30 percent of operating profit in this bracket
On that portion above 45 percent	Amount in previous brackets plus 50 percent of operating profit in this bracket

The capital investment figure is computed by summing expenditures for exploration, development and construction on the mine mill complex for each year. The total amount of investment is multiplied by an interest rate factor (that year's average prime interest rate plus ten percent of the prime rate). This interest rate factor is applied to the summed capital expenditures for the previous year(s) as well. This procedure is repeated each year until commercial operation begins.

The accumulative annual capital investments then become the denominator in the profitability ratio. This figure is fixed at the time of commercial production and cannot be changed unless there is a significant addition to the production capacity of the mine mill complex.

The capital investment is then divided by operating profit to come up with the profitability ratio. Operating profit is determined by taking gross sales and subtracting the sum of expenses: production costs, administrative and corporate expense allowance, marketing expense allowance, working capital allowance, the basic royalty, and the capital recovery allowance. Each of these is defined in detail:

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URANIUM MARKET

Production costs represent all expenses related to operating the production unit after commercial operation begins. These include an allowance for social capital costs and operating losses related to social capital items. Social capital covers investments made for providing services to a community or living quarters which are necessary for the operation of the production unit.

Not included in the production costs are expenses for depletion or exhaustion of a mine, depreciation, interest and expense on funded debt, expenses incurred for exploration, specific income taxes and administrative and corporate expenditures. Also payment or royalty expenses towards purchasing an option for or acquiring mineral rights are not included in calculating production costs.

The administrative and corporate expense allowance is an amount equal to five percent of the production costs. The marketing expense allowance is equal to three-fourths of one percent of the gross sales. The working capital allowance is an amount equal to the interest rate factor (the prime interest rate plus ten percent) times 10 percent of the production costs.

The capital recovery allowance is equal to the unrecovered capital investment plus that amount multiplied by the interest rate factor. As mentioned earlier, the capital investment figure becomes fixed at the time of the project's commercial operation. This figure becomes the initial balance in the capital recovery "bank". Each year the maximum amount of operating profit is applied to the capital recovery bank. The balance after profit deduction is multiplied by the interest rate factor and is carried forward to the following year. This method allows the royalty payer to make back the capital investment plus a percentage before graduated royalty payments begin.

As mentioned above, the exploration costs incurred once commercial operation begins are not included in the calculation of production expenses. However, once the owner of the mine-mill complex has depleted the capital recovery bank and begins to pay the graduated royalty tax, a tax credit based on a percentage of these exploration costs is given.

Table 2 is an example of a royalty calculation for a first year of operation based on the following data:

1. $17,600,000 in the capital recovery bank.
2. Production unit sells 300,000 pounds U_3O_8 at $15/pound U_3O_8, produced at $5/pound U_3O_8.

Table 2

EXAMPLE OF GRADUATED ROYALTY CALCULATION FOR AN EARLY YEAR OF PRODUCTION

	Thousands of Dollars
Revenues	4,500
Less Production Costs	(2,320)
Less Other Expenses	(200)
Less Basic Royalty	(135)
	1,845
Remaining Capital Balance	17,600
Less	(1,845)
Operating Profit	0
Remaining Bank	$15,755

In this example no graduated royalties are paid in the first year of production. The capital recovery bank balance of $15,755,000 is multiplied by the interest rate allowance. The new figure is carried forward and becomes the remaining capital balance number for the following year's calculation.

Table 3

EXAMPLE OF GRADUATED ROYALTY CALCULATION FOR A LATER YEAR OF PRODUCTION

	Thousands of Dollars
Revenues	30,000
Less Production Costs	(10,200)
Less Other Expenses	(1,000)
Less Basic Royalty	(900)
	17,790
Remaining Capital Balance	10,000
Less	(17,790)
Operating Profit	7,790
Remaining Bank	0

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Table 4

Percent Ratio of Operating Profit to to Capital Investment	Size of Increment (%)	Royalty Rate (%)	Incremental Operating Profit (Thousands of $)	Incremental Royalty (Thousands of $)
Below 15%	15	0	2,640	0
On that portion above 15% but below 45%	10	15	1,760	264
On that portion above 25% but below 45%	20	30	3,520	1,056
On that portion above 45%	1.6	50	282	141
	46.6		8,202	1,461

A calculation of the graduated royalty possible in a later year of production is shown in Table 3. In this example, the production unit has depleted its Capital Balance and has operating profits which are subject to the graduated royalty tax. The calculation is based upon:

1. $10,000,000 in the capital recovery bank.
2. Production unit sells two million pounds U_3O_8 at $15 pound U_3O_8, produced at $5 pound U_3O_8.

Table 4 applies the graduated tax formula to the operating profit and capital investment figures in Table 3. The profitability ratio is 46.6 percent and the total graduated royalty due is $1,461,000.

FAR EAST

As noted in last month's Report, **Japan's** Ministry of International Trade and Industry (MITI) submitted a policy report which recommended consideration of uranium stockpiling in Japan. Based on a desire for security of supply, it would seem that such a stockpile would be in the form of enriched product.

Implementing such a plan brings up questions of financing: who would purchase and maintain such a stockpile? Although it is premature for a definite answer, a possible solution is already in place. A private company, Japan Nuclear Fuel Service, was organized in 1980 to own and operate a 1200 ton per year reprocessing plant which is scheduled to be built by 1990. Discussions concerning the financing for this project are ongoing with the Japan Development Bank and include the topic of financing a uranium stockpile. Any action, however, is likely to be slow in coming. Moreover, in view of the current "long" position of the Japanese utilities, it is possible that the stockpile would not be built by new purchases, but rather by transfers from the utilities. The utilities could accelerate conversion and enrichment deliveries and return the enriched product to Japan earlier than would have otherwise occurred.

Korea's current nuclear program includes nine units totaling some 7400 MWe which are scheduled for operation prior to 1990. Included in this total are six Westinghouse PWR's (one of which is currently in operation), two Framatome PWR's and one Candu unit (scheduled for operation in 1982). Uranium requirements will be approximately three million pounds annually by 1990.

Based on Korea's substantial inventories and existing supply arrangements with Australian, Canadian, French and US sources it appears that new supplies are not needed until the late 1980's. These factors, combined with a reputation for hard bargaining, suggest that Korea will be in no hurry to conclude new supply contracts and will shop carefully before buying.

Taiwan Power Company's (TPC) current nuclear program includes two units in operation, a third unit expected to be in operation within a month, and three additional units under construction with anticipated

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operating dates of 1982, 1984 and 1985. With nearly 5000 MWe of nuclear capacity expected to be on line in 1985, Taiwan's uranium needs will approach two million pounds annually by that date.

Units 7 and 8 have yet to be ordered and lively competition, based largely on comparative financing advantages, has developed between US and French interests. Whatever the outcome, the units would not operate before the late 1980's or early 1990's. If the French receive the reactor order, it is possible that fuel (uranium and enrichment) will be included, as was the case earlier this year in Korea.

Political constraints have limited Taiwan's geographic diversity in establishing its uranium supply arrangements and have motivated a policy of holding substantial inventory both in the form of U_3O_8 and fabricated fuel. As a consequence, additional supplies, even to maintain desired inventory levels, are not needed until after 1985. It is not surprising, therefore, that Taiwan's procurement efforts are being pursued in a deliberate manner with a special view towards price advantage.

UNITED STATES

Nuexco has revised its estimates of US Nuclear Generating Capacity and US Apparent Future Consumption. The estimates were last printed in Report 147, November 1980. Comparisons of November 1980 and current Nuexco estimates are presented in Tables 5 and 6. The greatest change occurred in the Reactors Under Construction category for 1981. Reactors in this

Table 5

COMPARISON OF NUEXCO ESTIMATES OF US NUCLEAR ELECTRIC GENERATING CAPACITY REPORT 147 (NOVEMBER 1980) vs. THIS REPORT
(Thousands of MWe — Net)

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
US Reactors Operational										
Report 147	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8	50.8
Report 157	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0
Difference	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
% Change	+10.3	+10.3	+10.3	+10.3	+10.3	+10.3	+10.3	+10.3	+10.3	+10.3
US Reactors Under Construction										
Report 147	3.2	8.2	14.7	21.5	28.2	34.6	41.1	47.1	54.3	60.8
Report 157	-0-	3.9	8.4	14.1	23.0	28.2	34.8	41.9	47.8	54.3
Difference	-3.2	-4.3	-6.3	-7.4	-5.2	-6.4	-6.3	-5.2	-6.5	-6.5
% Change	-100	-52.4	-42.9	-34.4	-18.4	-18.5	-15.3	-11.0	-12.0	-10.7
US Reactors On Order										
Report 147	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
Report 157	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
Difference	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
Total										
Report 147	54.0	59.0	65.5	72.3	79.0	85.4	91.9	97.9	105.1	111.6
Report 157	56.0	59.9	64.4	70.1	79.0	84.2	90.8	97.9	105.8	110.3
Difference	2.0	0.9	-1.1	-2.2	0.0	-1.2	-1.1	0.0	0.7	-1.3
Cumulative Difference	2.0	2.9	1.8	-0.4	-0.4	-1.6	-2.7	-2.7	-2.0	-3.3
% Change	+3.7	+1.5	-1.7	-3.0	-0-	-1.4	-1.2	-0-	+0.7	-1.2

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Table 6

COMPARISON OF NUEXCO ESTIMATES OF US APPARENT FUTURE CONSUMPTION REPORT 147 (NOVEMBER 1980) vs. THIS REPORT
(Millions of Pounds U_3O_8)

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
US Reactors Operational										
Report 147	16.3	16.6	17.0	17.2	17.3	17.3	17.2	17.1	17.0	16.8
Report 157	17.9	17.8	18.4	18.6	18.8	18.9	18.8	18.7	18.6	18.4
Difference	1.6	1.2	1.4	1.4	1.5	1.6	1.6	1.6	1.6	1.6
% Change	+9.8	+7.2	+8.2	+8.1	+8.7	+9.3	+9.3	+9.4	+9.4	+9.5
US Reactors Under Construction										
Report 147	4.6	6.3	10.1	13.2	15.5	18.2	17.9	20.5	23.4	23.5
Report 157	2.7	3.6	9.8	11.0	12.6	17.2	15.4	18.9	15.3	22.0
Difference	-1.9	-2.7	-0.3	-2.2	-2.9	-1.0	-2.5	-1.6	-8.1	-1.5
% Change	-41.3	-42.9	-3.0	-16.7	-18.7	-5.5	-14.0	-7.8	-34.6	-6.4
US Reactors On Order										
Report 147	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
Report 157	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
Difference	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
Total										
Report 147	20.9	22.9	27.1	30.4	32.8	35.5	35.1	37.6	40.4	40.3
Report 157	20.6	21.4	28.2	29.6	31.4	36.1	34.2	37.6	33.9	40.4
Difference	-0.3	-1.5	1.1	-0.8	-1.4	0.6	-0.9	0.0	-6.5	0.1
Cumulative Difference	-0.3	-1.8	-0.7	-1.5	-2.9	-2.3	-3.2	-3.2	-9.7	-9.6
% Change	-1.4	-6.6	+4.1	-2.6	-4.3	+1.7	-2.6	-0-	-16.1	+0.3

category moved to Operational status for 1981 faster than had been anticipated. The NRC has outdone past performance in low power and full power licensing of power plants. However licensing is not approaching the rapid pace of the 1970's.

Overall, the change in US Nuclear Generating Capacity is not significant. The situation in the near term is affected on the plus side but the outlook for the future remains grim. The revised estimates indicate that the short term will be better than anticipated, while the long term may be worse owing to continuing schedule slippages of Reactors Under Construction.

When compared to the previous US Apparent Future Consumption forecasts, the new estimate does not represent much change. The US situation can be viewed as an indicator of the non-US situation with greater changes occurring in the US. Nuexco estimates of the situation outside the US show even less change versus the estimates presented in Report 147.

The US Bureau of Labor Statistics (BLS) periodically adjusts its industry employment series to more recent benchmarks (comprehensive counts of employment) to correct for sampling variability and for changes in industrial activity.

With the release of data for June 1981, the BLS introduced revised establishment survey estimates of employment, hours, earnings, and labor turnover to reflect the benchmarks for March 1980. These revisions affect the employment series from March 1979 (the previous complete count) forward to the current month's estimate. Revised historical data for average

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hourly earnings will be presented in a supplement to the BLS publication "Employment and Earnings" to be issued in August. As soon as possible thereafter, these revised historical data will be reprinted in the Nuexco Report.

TRANSACTIONS

There are four uranium transactions reported this month. One involves less than 50,000 pounds U_3O_8 for immediate delivery. The seller is a US producer; the buyer is a Far East government. The negotiations of this transaction have been ongoing for several months and as a result, the price involved is not completely reflective of the current market. The second transaction is for between 300 thousand and 600 thousand pounds U_3O_8 from a Canadian producer to a US utility. Delivery is to take place in 1981.

The third transaction is the sale of between 100 thousand and 300 thousand pounds U_3O_8 from a US producer to a US utility, with delivery taking place late next year. The final transaction reported this month is a long term sale from a Canadian producer to a US utility for between three million and six million pounds U_3O_8 to be delivered between 1984 and 1994.

There are no secondary market conversion transactions reported this month.

PRICING

The **Exchange Value** remained at $23.50 per pound U_3O_8, unchanged from last month. The following factors were significant in determining the Exchange Value this month.

1. Three near term transactions involving a total well in excess of one million pounds U_3O_8 are in the final stages of negotiation at prices near current Exchange Value.

2. Many sellers are offering or appear willing to offer large amounts of material at prices about equal to Exchange Value.

3. For the first time in many months, near term supply and near term demand are close to the same order of magnitude. Material being actively offered for sale and delivery over the next year totaled 7.2 million pounds U_3O_8 equivalent. Active inquiries to purchase during the same time frame came to 4.0 million pounds U_3O_8.

Although supply still exceeds demand by a ratio of about two to one, in the recent past it has been more on the order of ten to one. Thus the market currently seems to be showing some strengthening in the demand sector. Also indicative of strengthening is the fact that utilities represent about 60 percent of the purchasers actively seeking material in the near term market. Producer inquiries make up the balance of buying interest. The fact that utilities are now actively seeking over two million pounds U_3O_8 is significant because it has been some time since utility demand for near term delivery has been so strong.

On the supply side, about 60 percent of material being offered for sale comes from inventory holders. This activity continues to be the major bearish influence on the market.

The **Transaction Value** decreased slightly to $24.30 per pound U_3O_8. This months's calculation included ten transactions. The **Loan Use Charge Rate** remained at 5½ percent.

The US Department of Energy (DOE) has issued its annual Survey of United States Uranium Marketing Activity[1]. The *actual* average contract price for US origin uranium delivered to US buyers for calendar year 1980 was $28.15 per pound U_3O_8. This is up from previous estimates of $26.00 reported as of July 1, 1980[2] and $25.40 reported as of January 1, 1980[3].

The estimated average price for US origin uranium reported in the current DOE Report for 1981 delivery is $30.70, and for 1982 delivery is $37.70. These figures include market price settlements of market price contracts to the extent that settlements have been made. Average floor prices for market price contracts for US origin material were $46.45 for 1981 delivery and $49.70 for 1982. For the first time, DOE also included prices of non-US origin uranium delivered to US buyers. The average was $43.10 for 1980 delivery and $40.00 for 1981.

These figures would indicate that material is currently being delivered under old contracts at prices substantially above Exchange Value. The history of the uranium market would suggest that whenever contract prices become substantially out-of-phase with spot prices, one might expect to see renegotiation or

[1]DOE NE-0013, "Survey of United States Uranium Marketing Activity," June 1981.

[2]DOE Release No. 80-155 "DOE reports results of uranium price surveys," October 1980.

[3]DOE RA-0053, "Survey of United States Uranium Marketing Activity," July 1980.

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cancellation of contracts, or even litigation. These activities occurred extensively after prices rose in the early 1970's. Similar events may be commencing now that prices have fallen. For example, Getty Oil Co. recently announced an agreement with two groups of purchasers, whereunder two long term supply contracts were terminated. Discussions involving other long term contract renegotiations have also taken place. While it is too early to predict a trend in this area, the driving forces for renegotiations are evident. This is significant because Nuexco's previously published estimates of US uranium production were based on the assumption that most existing long term supply contracts would remain in force, especially output-type contracts. Of course, any significant renegotiations of existing contracts would likely result in further decreases in estimated US production.

Also indicative of this retrenchment of the US uranium industry is additional data published in the recent DOE Report. US buyers contracted with US primary producers for an additional 25 million pounds of US origin U_3O_8 during 1980. However, those new commitments were more than offset by a 51.2 million pound reduction in delivery commitments under previous contracts, resulting in a net decrease of 26.2 million pounds of total future commitments. This is the first year in which reduction of commitments exceeded new procurement. In addition, uncommitted uranium estimated by US producers to be available for sale, as published in the DOE Report, has decreased over the last two years, as shown in Table 7. This estimate also indicates reduced production plans. In fact, much of the material listed in Table 7 will likely not be produced at all.

Table 7

UNCOMMITTED URANIUM ESTIMATED BY US PRODUCERS TO BE AVAILABLE FOR SALE[1]
(Millions of Pounds U_3O_8)

Year of Delivery	As of 1/1/79	As of 1/1/80	As of 1/1/81
1981	8.0	6.2	5.0
1982	13.4	8.6	5.6
1983	16.8	14.2	8.4
1984	20.2	15.6	11.0
1985	21.0	17.6	13.6

[1]Source: DOE NE-0013 "Survey of United States Uranium Marketing Activity," June 1981.

CONVERSION

The **Conversion Value** dropped to $1.10 per pound U from the previous month's level of $1.15 per pound U. There are no secondary market conversion transactions reported this month. However, one transaction involving a substantial quantity of near term conversion services is near closing. The price being discussed is a little below current Conversion Value. There continues to be downward pressure in the secondary market because inventory sellers must offer attractive prices to get the attention of the limited number of potential buyers.

As indicated in the *Market Opportunities* section of this Report, the total of secondary market conversion services available for near-term sale is about 1.9 million pounds U. Total near-term demand is 450 thousand pounds U.

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TOPICAL ESSAY

UNCONVENTIONAL TRANSACTIONS: PART THREE, BARTERS

This essay is the final installment in a three part series on unconventional transactions. The basic premise of these essays has been that in times of extreme supply-demand imbalances, high interest rates, excess inventories, and rapidly changing prices, unusual mechanisms must sometimes be developed to optimize selling, buying, and inventory handling strategies. The subjects of the first two essays were inventory upgrading and uranium options; in this essay fuel bartering is discussed.

Fuel bartering is simply the exchange of uranium for any other fuel source such as oil, coal, or natural gas. One party desiring to sell uranium and wanting to obtain another fuel would exchange its uranium for the fuel desired. A second party desiring uranium but wishing to sell another fuel exchanges its fuel for the first party's uranium.

Barter Candidates

The most likely candidates to participate in a fuel barter will fall into one of two categories. The first will be a utility which uses both uranium and an additional fuel, but has an imbalance of inventory in one or the other. For example, the utility may have both nuclear and oil fired electrical plants, and have too much uranium but not enough fuel oil. Alternately, the utility may have too little uranium but an excess of fuel oil.

The second candidate will be a producer or possibly a trader with dealings in both uranium and another fuel. This producer may desire to sell one of the fuels and have either a need for or the ability to dispose of the other fuel. For example, an oil company which has uranium production for sale would be able to barter uranium for oil, which it could in turn either use to fill its existing oil commitments or sell to another party through its established sales channels.

For purposes of this discussion it is assumed that a typical barter combination would be an oil company with uranium for sale and a utility with a need for uranium but with excess oil, due to decreasing load growths and the current glut in the oil market.

Advantages

The advantage to each party in bartering rather than merely selling their oil and uranium stocks stems from the fact that one of the most difficult aspects of a normal uranium sale at this time is getting the parties to agree on price. With a barter transaction, this potential source of disagreement is partially eliminated. With two commodities under consideration, there are two prices and thus two variables. Rather than agreeing on both prices, it is only necessary to agree upon an exchange *ratio*, that is, the number of pounds of uranium to be bartered for a barrel of oil or a ton of coal.

Figure 1 shows this concept graphically for an oil to uranium barter. The horizontal axis represents the price of oil in US dollars per barrel as valued by one of the parties. The vertical axis represents the uranium price in US dollars per pound U_3O_8 as valued by one of the parties. The diagonal lines are constant ratio lines where the relative value of the uranium compared to the value of the oil remains the same. For example, the uranium owning party may wish to value its uranium at $25.00 per pound U_3O_8 but may not be sensitive about the value of oil. Thus it might propose a ratio of 0.79 bbl oil per pound U_3O_8. The other party may wish to value the incoming uranium at $20.00 per pound U_3O_8. By valuing its oil at $27.50 per bbl oil, the second party may still agree with the ratio proposed by the first party, and in fact strike a deal, despite the fact that the two sides have not reached a consensus on the value of the uranium.

Not only does this aspect of a barter make the contract easier to negotiate, but there may be other advantages to this "disguising" of the actual price. Specifically:

1. If the uranium or oil has been purchased at a low price relative to today's market, there may be income tax advantages because the barter may be viewed as a tax free exchange of like property. Conversely, if the material was purchased by a utility at a high price and the utility is having difficulty selling because of required Public Utility Commission approval to sell at a lower price, a barter may be an effective way to do so.

2. Both the oil and uranium markets are currently experiencing a glut, with resultant stagnant or declining prices. A fuel barter will possibly avoid contributing to a further decline in prices.

3. A fuel barter can potentially create a long term uranium contract with an up-front payment. In the current uranium market it is virtually impossible for the seller of uranium to be paid in advance of delivery. However, if a utility wishing to procure uranium possesses excess oil stocks, it may elect to turn these stocks over to an oil company in exchange for fut

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TOPICAL ESSAY

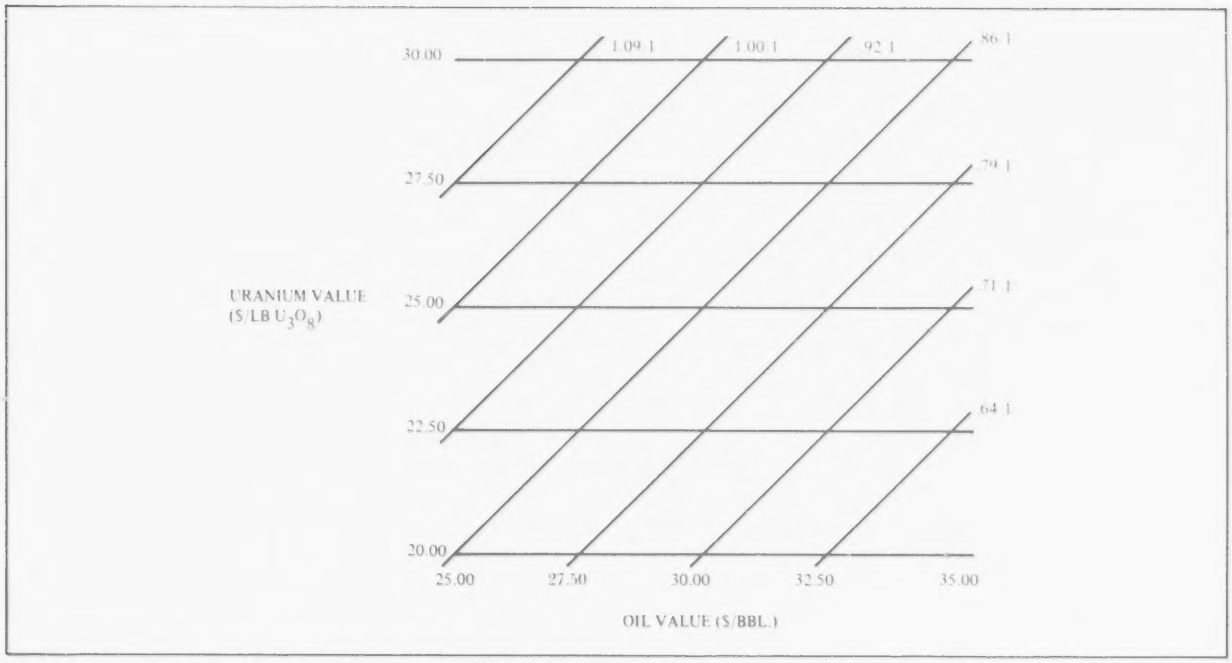

Figure 1

CONSTANT RATIOS FOR DIFFERENT URANIUM AND OIL VALUES (RATIOS EXPRESSED AS BBL. OIL/LBS. U_3O_8)

delivery of uranium. This is in effect a payment in advance, and the parties would probably make some concession in the exchange ratio to reflect the advantage of the advance payment to the uranium supplier. This type of transaction may appeal to both sides. The utility obtains an attractive long term uranium contract as well as immediate value from the funds currently lying idle in excess oil stocks, while the oil company receives a long term uranium contract with advance payment.

Terms

A barter transaction differs from a typical sales contract as far as the crucial terms are concerned. The primary terms include:

1. The specifications of the alternate fuel. Coal and oil have specifications that affect the quality of the material and vary widely from lot to lot. Btu content, sulfur content, viscosity, ash, and other specifications must be predetermined in order to assess the relative value of the fuel being bartered.

2. The ratio of uranium per unit of alternate fuel bartered.

3. The delivery point. For uranium, this is not a particularly difficult matter, since transportation costs for uranium are not significant. However, for coal and oil, transportation costs may be a large part of the total cost, and may in some cases even exceed the cost of the material itself.

4. Delivery times. If one fuel is to be delivered at a different time from the other, the party delivering earlier may be credited with an appropriate altering of the exchange ratio.

As with inventory upgrading (Topical Essay, Nuexco Report 155) and uranium options (Topical Essay, Nuexco Report 156), the main advantage in bartering is the increased flexibility it gives the parties in addition to the potential economic advantages. It is not surprising that the recent turmoil in the uranium market has given rise to the consideration of these unconventional transactions.

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ESSAY

NPT UPDATE

The June 1981 Bulletin of the International Atomic Energy Agency (IAEA) lists 111 non-nuclear-weapon States which are party to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT). With the addition of three of the five nuclear-weapon State signatories, the US, United Kingdom and Union of Soviet Socialist Republics, the NPT member total is 114. France and the People's Republic of China are the remaining nuclear-weapon States but they have not signed the NPT.

Since the end of 1979, Barbados, Turkey and Egypt (all non-nuclear-weapon States) have joined the list of NPT signatories. Egypt is the newest addition to the group and became party to the NPT on February 26, 1981. Egypt's ratification was viewed as opening the door for French reactor sales and also as reopening negotiations with Westinghouse Electric Corp. for additional sales.

Under the terms of the NPT, a nation which signs the Treaty must submit instruments of ratification or accession from its national government to the NPT depositary nations: the US, UK and USSR. Each non-nuclear-weapon State signatory is also required to execute an agreement with the IAEA. This agreement provides the framework for implementation of the safeguards specified under the Treaty. As of May 14, 1981, the IAEA had negotiated safeguards agreements with 78 of the 111 non-nuclear-weapon States party to the NPT. Safeguards agreements were in force with 69 of these States. Indonesia, Libya and Senegal are the most recent addition to the 69, having brought their NPT safeguards agreements into force during 1980. The other nine safeguards agreements had been approved by the IAEA Board of Governors and were awaiting entry into force.

There are many cases where non-nuclear-weapon States have signed the NPT but have not concluded the relevant safeguards agreement with the IAEA. Some of these agreements are more than ten years overdue. However, the IAEA is continuing efforts towards their completion. As far as the Agency is aware, there is no nuclear material or nuclear activity in any of these States that would require the practical application of safeguards, with the exception of one State in which the activity is covered by a non-NPT safeguards agreement.

Nations which have not signed the NPT can enter into safeguards agreements with the IAEA which cover all or part of the countries' nuclear activities. By placing their nuclear activities under IAEA inspection with the agreements, these nations are allowed access to nuclear materials. NPT members are not permitted to transfer nuclear material, including natural uranium, to non-nuclear-weapon States unless that material is subject to IAEA inspection in the recipient State, whether or not that State is a party to the NPT.

Spain is a recent example of this. Although Spain has not yet acceded to the NPT, all of its nuclear facilities were, for the first time, placed under Agency safeguards with the signing of two safeguards agreements in Vienna on April 1 of this year. The agreements entered into force on May 11. The US State Department followed the signing with approval for the issuance of export licenses for low-enriched fuel destined for Spain.

In 1980 IAEA safeguards agreements were in force with 11 non-nuclear-weapon States which had not signed the NPT: Argentina, Brazil, Chile, Colombia, Cuba, the Democratic People's Republic of Korea (North Korea), India, Israel, Pakistan, South Africa and Spain. The agreements with Argentina, Brazil, Chile, Colombia, Cuba, the Democratic People's Republic of Korea and Spain covered all substantial nuclear activities, present or future, of which the Agency was aware. In the other countries, unsafeguarded nuclear facilities were in operation or under construction.

Safeguards are actually being enforced in those countries where nuclear activities have reached the stage at which reports and verification actions are required under the existing agreements. The number of installations under safeguards increased during 1980 from 700 to 744. Most of the material under safeguards (92 percent of total plutonium and 94 percent of total uranium) in 1980 was located in States which had submitted all their peaceful nuclear activities to safeguards. The quantities of safeguarded nuclear material changed in 1980 as follows: separated plutonium decreased 38 percent to five tonnes; plutonium contained in spent fuel rose by 30 percent to 78 tonnes; highly enriched uranium increased 18 percent to 13 tonnes; low-enriched uranium rose 18 percent to 13,872 tonnes, and source material rose 24 percent to 19,097 tonnes.

Table 8 represents a summary of the NPT status and bilateral agreements status of those nations with near term potential to purchase or sell uranium.

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Table 8

Nation[1]	NPT Member	Has Safeguards Agreement in Force With the IAEA	Has Bilateral Agreement With United States For Nuclear Power[3]	Has Bilateral Agreement With Canada	Has Bilateral Agreement With Australia
Algeria					
Argentina		X	X	X[9]	
Australia	X	X	X[6]	X	
Austria	X	X	X		
Belgium	X	X	X	X	
Brazil		X	X		
Bulgaria	X	X			
Canada	X	X	X[6]		X
China, People's Republic of					
Czechoslovakia	X	X			
Denmark	X	X	X	X	
Egypt	X		X[8]		
Finland	X	X	X	X	X
France			X	[7]	X[11]
Gabon	X				
German Democratic Republic	X	X			
Germany, Federal Republic of	X	X	X	X	
Hungary	X	X			
India		X[2]	X		
Indonesia	X	X	X[10]		
Iran	X	X			
Iraq	X	X			
Ireland	X	X	X	X	
Israel		X[2]			
Italy	X	X	X	X	
Japan	X	X	X	X	
Korea, Republic of	X	X	X	X	X
Luxembourg	X	X	X	X	
Mexico	X	X	[4]		
Netherlands	X	X	X	X	
Niger					
Norway	X	X	X[10]		
Pakistan		X[2]			
Philippines	X	X	X	X	X
Poland	X	X			
Portugal	X	X	X		
Romania	X	X		X	
Saudi Arabia					
South Africa Namibia		X[2]	X		
Spain		X	X	X[9]	
Sweden	X	X	X	X	X
Switzerland	X	X	X		
Taiwan (Republic of China)	X		X		
Thailand	X	X	X		
Turkey	X		X		
Union of Soviet Socialist Republics	X				
United Kingdom	X		X	X	X
United States	X			X	X
Venezuela	X		X[5]		
Yugoslavia	X	X	[4]		

(Footnotes on following page)

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ESSAY

Footnotes to Table 8

[1] Only nations with near term potential to purchase or sell uranium are included. The five nuclear weapon States are listed in italics.

[2] Not all nuclear facilities are covered under safeguards agreement.

[3] Only agreements regarding power generation are included. The US has agreements with other nations regarding nuclear research, but those are not included. Egypt, Israel, Iran and Greece hold long-term, fixed-commitment enrichment contracts with the US, which can be implemented only after bilateral safeguards agreements have been signed.

[4] There are special agreements whereunder the US supplies uranium for specific projects to Mexico and Yugoslavia through the IAEA. All such uranium is subject to IAEA safeguards.

[5] Agreement expired in 1980.

[6] Renegotiated bilateral agreement in force.

[7] Only allows the enrichment of Canadian material for use in other Euratom countries.

[8] Agreement has been signed by President Reagan and is expected to enter into force this year.

[9] New agreements have been negotiated, but cannot be signed until compliance with safeguards requirements. Arrangements for trade under existing contracts are continuing.

[10] Renegotiations of revised bilateral agreement are complete.

[11] Safeguards agreement negotiated but not yet in force.

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SPANISH NUCLEAR PROGRAM — PART II

Regional Geology

The geomorphology of Spain consists primarily of broad mountain chains and high plateaus which were developed during two distinct periods of regional tectonics. The first tectonic event was the Hercynian (Upper Carboniferous Period) which has been age-dated at 325 to 350 million years. The main geologic feature developed at that time was the Central Iberian Mountain Zone which occupies a large portion of west-central Spain. It is one of Spain's most important mineralized belts, especially for uranium.

The second tectonic event was the development of the Alpine Mountain Chains which parallel the south and southeast coastal areas as well as the Spanish French border. All Alpine tectonics occurred during Cretaceaous and Early Tertiary time which dates from about 135 to 65 million years. The Alpine Mountain Chains contain a number of uranium occurrences, but each is of rather limited size and a development schedule is uncertain.

During the mountain building process, the intervening low-lands were uplifted to form the high plateaus common throughout the Spanish interior. The plateau regions, or mesetas, experienced continuing transformation through heavy erosion and structural subsidence well into Tertiary times. As a result, the mesetas collected varying thicknesses of coarse to fine Tertiary sediments basinward. The source of the sedimentary material was the older rocks which eroded from the surrounding mountains. The Early Tertiary sediments filling the basins and the deeper Triassic and Jurassic rocks are considered favorable hosts for uranium mineralization. Figure 2 shows the principal mountain chains and sedimentary basins of Spain.

Uranium Geology

The basal geology of most mountain chains in Spain includes a sequence of Precambrian strata consisting of bedded sandstone, quartzites and dolemites that has been thrust upward to form broad folds. A thick Paleozoic sequence unconformably overlies the older rocks. The entire Paleozoic section has been folded and faulted to make up the present high mountain terrain. Metamorphism of all formations is a local feature associated with irregular and sometimes massive intrusions of Hercynian granites. Important uranium mineralization is associated with Cambrian slates at the base of the Paleozoic sequence and Hercynian granites, primarily in the Central Iberian Mountain Zone. Uranium mineralization in the Alpine fold belts is limited to minor occurrences in Lower Paleozoic rocks.

The geologic history of the mesetas is revealed in areas where extensive erosion has taken place. The Paleozoic sequence overlies Precambrian basement rocks. The Paleozoic strata in turn is overlain by Mesozoic deposition consisting of Triassic, Jurassic and Cretaceous sediments. Each formation shows evidence of folding and faulting associated with mountain building tectonics. The general attitude of the formations shows steep dips which are adjacent to mountain fronts. However, all structural features moderate basinward. Tertiary sediments deposited directly on the eroded surface of Paleozoic and Mesozoic rocks are generally flat-lying, but minor folds and faults show the effects of late Alpine Tectonics.

There are three principal Tertiary basins in Spain representing an area of approximately 100,000 square kilometers; each is considered to be geologically favorable for uranium mineralization in Tertiary and Mesozoic rocks. The Ebro basin, situated between the northeast southwest trending Iberian and Pyrenees Mountain Chains, may be the deepest of the three. Tertiary sediments are known to exceed 3300 meters in the northwest part of the basin. Uranium mineralization has been noted along the mountain flanks on both sides of the basin.

The Duero Basin may be the largest of the three. It is surrounded by the Cantabrian Mountains on the north, the Central Iberian Zone on the west and south and the Iberian Chain on the east. The thickness of the Tertiary cover varies throughout the basin. Uranium mineralization has been discovered in Mesozoic rocks along the western edge of the basin. Much of the basin interior remains to be explored.

The Tajo Basin extends southward from Madrid about 130 miles to the northern extremity of the Betic Mountain Chain and is limited to the west by the Central Iberian Zone. Although the Tertiary sediments filling the basin represent favorable exploration targets, known uranium occurrences are limited to the eastern flanks of the Central Iberian Zone and the recent discovery of Mazarete.

Spain's Empresa Nacional del Uranio S.A. (ENUSA) has an extensive exploration program planned for the three basin area. Eocene and Miocene sediments represent the likely host formations within the basin

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interiors. Paleozoic and Mesozoic sediments are favorable host targets along the mountain fronts where the Tertiary cover is relatively thin or completely removed by erosion. The ore at Mazarete, Guadalajara was discovered on outcropping Jurassic sandstone along the eastern edge of the Tajo Basin. Drilling results indicate that the mineralization extends down-dip. It now appears to be an important discovery and ENUSA is planning to increase exploration in the area. However, most uranium occurrences are found in older rocks along the mountain fronts where Cambrian slates and Hercynian granites outcrop. The important ore occurrences at Ciudad Rodrigo in Salamanca Province occur in this environment.

Ciudad Rodrigo Project

Uranium mineralization was discovered in the vicinity of Ciudad Rodrigo, Province of Salamanca, in the 1960's by the state-owned Junta de Energia Nuclear (JEN). A number of mineral occurrences were noted in Cambrian slates and Hercynian granites along the northeast front of the Central Iberian Mountain Zone. JEN continued exploration in the district and subsequently established a uranium reserve of about 5000 tonnes U_3O_8. Jurisdiction over the ore deposits was transfered to ENUSA in 1973. Exploitation of the deposits by ENUSA began in 1974. At the same time ENUSA began detailed exploration throughout the Ciudad Rodrigo district. Since 1976, the exploration program has spread to include much of the mountain frontal areas in western Salamanca Province. Exploration progressed rapidly with the utilization of the latest geophysical and geochemical techniques.

The exploitation effort has met with considerable success. Total uranium reserves are now estimated by ENUSA at 16,700 tonnes U_3O_8. The estimate of exploitable reserves is 15,500 tonnes U_3O_8 at a grade of 0.07 to .10 percent, most of which occur at the Mina FE location. Additional radioactive anomalies and mineral occurrences have been located in the district and are presently being evaluated. ENUSA's main exploration efforts continue to be centered in the Salamanca district.

Approximately 80 percent of exploitable reserves in Spain are located in the western mineral zone of the Salamanca district. The uranium mineralization commonly occurs in igneous and metamorphic rocks of the Paleozoic sequence. About 90 percent of the ore reserves occur in a highly fractured segment of Cambrian slates. Secondary uranium minerals have concentrated on fracture surfaces in a zone that is 30 to 50 meters thick. The mode of mineralization resembles a typical enrichment blanket whereby the slates above and below the blanket are almost completely barren of uranium. The Cambrian strata above and below the slate consists of alternating carbonaceous beds and quartzitic conglomerates of which none are mineralized.

The remaining ten percent of mineralization occurs as primary uranium minerals (coffinite and pitchblende) in veins and fractures within Hercynian granites. It is not uncommon to find traces of uranium in the Tertiary sediments closely associated with mineralized older rocks. In fact, radioactive anomalies in Tertiary sediments are a useful exploration guide to underlying Paleozoic mineralization.

The source of uranium mineralization is considered to be the Hercynian granites. Highly disseminated uranium was leached from the granites by the process of oxidation which occurred during extensive periods of alteration and weathering. The uranium-bearing solutions migrated along faults and fractures. The uranium was precipitated in a reducing environment throughout the favorable host rocks.

Exploitation activities are centered around the Mina FE location. The Mina FE mine is the principal source of ore, however lesser amounts are mined from small satellite deposits within the district. All mining is open-pit. Figure 3 is an aerial view of the Mina FE mine area.

Following the mining, the ore is crushed to about 2.5 cm. It is then stacked in large rectangular piles for heap-leaching by the controlled application of acid. Figure 4 is an aerial view of the heap-leach facilities. Annual production from the operation averages 130 tonnes U_3O_8. The production facility will be expanded to 600 tonnes U_3O_8 per year by 1985 or 1986. ENUSA believes that the Ciudad Rodrigo project will continue to be the principle source of domestic uranium.

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Figure 2
LOCATION OF PRINCIPAL MOUNTAIN CHAINS, SEDIMENTARY BASINS AND URANIUM DEPOSITS IN SPAIN

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Figure 3

AERIAL VIEW SHOWING MINA FE MINING AND HEAP-LEACHING OPERATIONS, CIUDAD RODRIGO, SALAMANCA

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Figure 4

AERIAL VIEW OF MAIN HEAP-LEACHING OPERATION
AT CIUDAD RODRIGO, SALAMANCA

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STATISTICAL DATA

EXCHANGE VALUE $23.50/lb. U_3O_8
Determined as of August 31, 1981

Definition

The Exchange Value is Nuexco's judgment of the price at which transactions for significant quantities of natural uranium concentrates could be concluded as of the last day of the month.

Derivation

Nuexco bases the Exchange Value upon:

A. Data from recently completed transactions.

B. Data from pending transactions.

C. Firm bids to buy and firm offers to sell.

D. Prices purchasers have expressed a willingness to pay, but for which Nuexco is not aware of firm bids to buy, and prices sellers have expressed a willingness to accept, but for which Nuexco is not aware of firm offers to sell.

Comments

Nuexco does not consider the following in determining the Exchange Value:

A. The price of uranium delivered or to be delivered under old contracts.

B. The price of uranium delivered in connection with contract renegotiations or other than arm's length transactions.

TRANSACTION VALUE
Determined as of August 31, 1981

$/lb U_3O_8	Millions of Pounds	Number of Transactions	Number of Months
24.30	2.6	10	5

Definition

The Transaction Value is a weighted average price of recent transactions, and is based on prices paid for U_3O_8 in transactions closed within the previous three-month period and for which delivery was scheduled within one year of the transaction date. At least ten transactions totaling at least two million pounds U_3O_8 are included in each calculation, or the sample time is extended as necessary to include these minima. Foreign currencies are converted to US dollars as of the transaction date.

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STATISTICAL DATA

EXCHANGE AND TRANSACTION VALUES SINCE JANUARY 1977

Determined as of the last day of the month indicated

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STATISTICAL DATA

HISTORICAL EXCHANGE VALUES

Determined as of the last day of the month indicated (US Dollars lb. U_3O_8)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1968	–	–	–	–	–	–	–	6.35	6.35	6.40	6.45	6.50
1969	–	6.35	6.10	6.10	6.25	6.25	6.20	6.20	6.15	6.15	6.15	6.20
1970	6.30	6.30	6.30	6.30	6.30	6.30	6.30	6.20	6.15	6.15	6.15	6.15
1971	6.20	6.20	6.20	6.20	6.15	6.05	6.00	5.95	5.95	5.95	5.95	5.95
1972	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95
1973	5.95	6.00	6.10	6.20	6.45	6.50	6.50	6.50	6.50	6.50	6.75	7.00
1974	7.70	7.90	8.00	9.00	9.50	10.50	11.50	12.00	12.50	14.00	14.75	15.00
1975	16.00	16.00	18.00	20.00	21.00	23.00	24.70	26.00	26.00	28.50	30.00	35.00
1976	35.20	37.00	39.25	40.00	40.00	40.00	40.00	40.40	41.00	41.00	41.50	41.00
1977	41.35	41.50	41.60	41.60	42.00	42.25	42.25	42.25	42.40	42.75	43.20	43.20
1978	42.90	43.25	43.25	43.25	43.40	43.40	43.40	43.10	43.25	43.00	43.25	43.25
1979	43.25	43.25	43.25	43.25	43.25	43.00	42.70	42.70	42.20	42.20	41.00	40.75
1980	40.00	38.00	35.00	32.00	32.00	31.50	31.50	30.00	28.50	28.00	28.00	27.00
1981	25.00	25.00	25.00	25.00	25.00	24.25	23.50	23.50				

HISTORICAL TRANSACTION VALUES

Determined as of the last day of the month indicated (US Dollars lb. U_3O_8)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1976	–	–	–	–	39.60	39.70	39.70	40.40	40.30	40.60	40.70	40.70
1977	41.30	41.30	41.40	41.50	42.80	42.90	43.00	42.60	42.50	42.80	42.90	42.90
1978	43.10	43.30	43.70	43.60	43.60	43.20	43.30	43.40	43.40	43.60	43.40	43.70
1979	43.60	43.80	43.70	43.40	43.60	43.70	43.70	43.60	43.60	43.60	43.50	42.30
1980	42.00	39.30	38.60	38.40	37.90	37.60	37.30	31.60	30.60	29.00	28.70	27.70
1981	27.20	27.20	27.00	25.70	25.70	24.50	24.40	24.30				

EXCHANGE VALUE EXPRESSED IN SELECTED PRODUCER & CONSUMER CURRENCIES*

Country	per lb U_3O_8 in Concentrates	per kg U_3O_8 in Concentrates	per kg U in Concentrates
US (dollar)	23.50	51.81	61.09
France (franc)	137.35	302.80	357.07
FRG (mark)	57.53	126.83	149.56
Japan (yen)	5,370	11,839	13,961
Switzerland (franc)	49.97	110.16	129.91
UK (pound)	12.69	27.97	32.99
Australia (dollar)	20.43	45.04	53.11
Canada (dollar)	28.22	62.23	73.38
Niger, Gabon (CFA)	6,867	15,140	17,854
South Africa (rand)	22.17	48.88	57.64
Sweden (kröner)	123.23	271.68	320.37

*Calculated using currency exchange rates published in the Wall Street Journal on the last business day of the month.

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STATISTICAL DATA

CONVERSION VALUE $1.10/lb. U as UF_6
Determined as of August 31, 1981

Definition

The Conversion Value is Nuexco's judgment of the price at which spot and/or near term transactions for significant quantities of conversion services could be concluded in the secondary market as of the last day of the month.

Derivation

Nuexco bases the Conversion Value upon:

A. Data from recently completed transactions.

B. Data from pending transactions.

C. Firm bids to buy and firm offers to sell.

D. Prices purchasers have expressed a willingness to pay, but for which Nuexco is not aware of firm bids to buy, and prices sellers have expressed a willingness to accept, but for which Nuexco is not aware of firm offers to sell.

Comments

Nuexco does not consider the following in determining the Conversion Value:

A. The price of conversion services delivered or to be delivered under old contracts.

B. The price of conversion services delivered in connection with contract renegotiations or other than arm's length transactions.

LOAN USE CHARGE RATE 5½%
Determined as of August 31, 1981

Definition

The Loan Use Charge Rate is Nuexco's judgment of the annual interest rate at which uranium loans could be concluded as of the last day of the month.

Derivation

Nuexco bases the Loan Use Charge Rate upon:

A. Data from recently completed or pending loan transactions.

B. Rates included in firm proposals to borrow or lend.

C. Rates that potential borrowers and lenders have expressed as a willingness to pay or accept, but for which Nuexco is not aware of firm proposals.

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STATISTICAL DATA

CURRENT TRANSACTIONS*

Nuexco Reference Number	Delivery Period	Approximate Quantity (thousands of pounds, U_3O_8 equivalent)	Approximate Price as percent of Current E.V.	Seller Group	Buyer Group	Remarks
Uranium Transactions						
1588	1981	Less than 50	108	US	Far East	
1592	1981	301-600	–	Canada	US	Definitive price information not available
1599	1982	101-300	115	US	US	
1602	1984-94	3001-6000	–	Canada	US	Price related to market

Nuexco Reference Number	Delivery Period	Approximate Quantity (thousands of pounds, U equivalent)	Approximate Price as percent of Current C.V.	Seller Group	Buyer Group	Remarks
Conversion Transactions						

*Transactions listed include not only those in which Nuexco was involved, but also all others of which Nuexco is aware.

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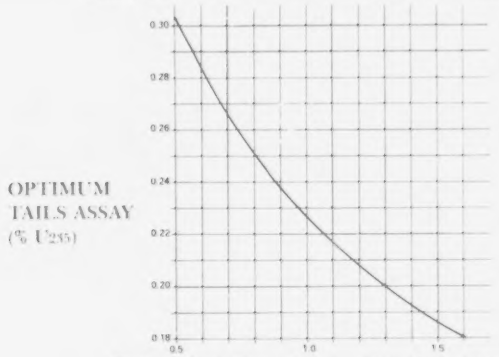
STATISTICAL DATA

OPTIMUM TAILS ASSAY

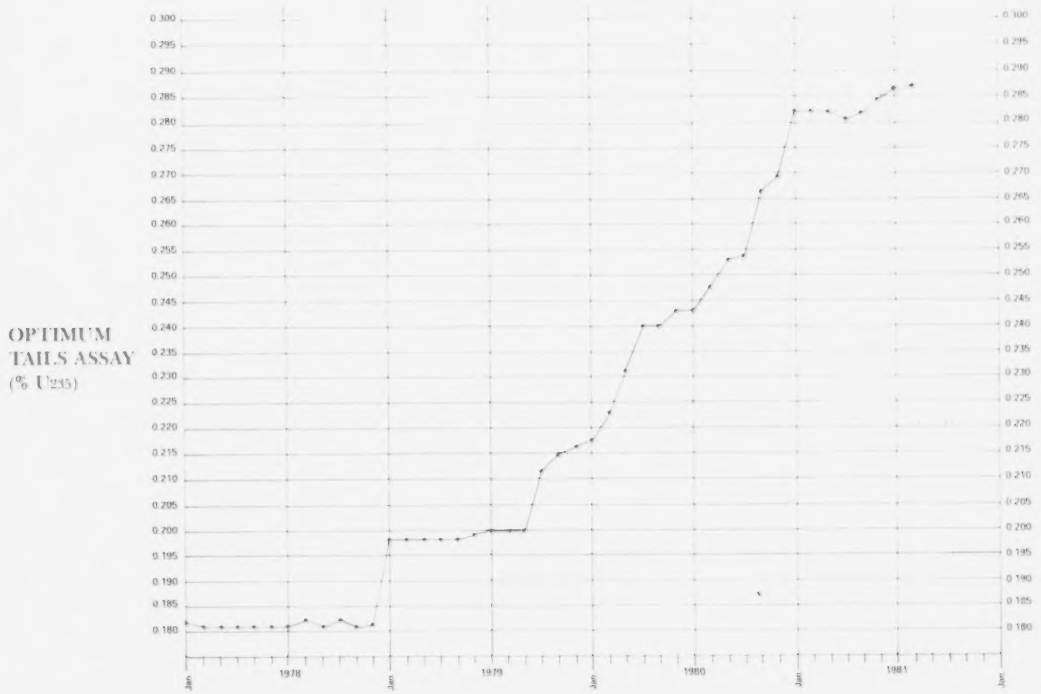
The optimum tails assay is the tails composition at which the cost of enriched uranium is lowest for given costs of separative work (SWU) and natural uranium feed. It depends only on the ratio of the cost of a kilogram of natural uranium in the form of UF_6 to the cost of a kilogram unit of separative work. The US Department of Energy (USDOE) Adjustable Fixed Commitment (AFC) enrichment contract holders have the option, within limits, to specify the transaction tails assay. The transaction tails assay for USDOE Requirements contracts is 0.2 percent U_{235}. For every one-hundredth of one percent increase in the transaction tails assay, uranium consumption increases about two percent.

TAILS ASSAY FOR MINIMUM COST OF PRODUCT*



*From Nuexco Report 138

OPTIMUM TAILS ASSAY†



†Based on Exchange Value and USDOE AFC SWU price; interpolated to the nearest thousandth.

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STATISTICAL DATA

US GOVERNMENT STATISTICS

	Producer Price Index—Industrial Commodities (1967 = 100)[1]	Consumer Price Index (1967 = 100)[2]	GNP Implicit Price Deflator (1972 = 100)[3]	Gross Average Hourly Earnings of Production or Non-supervisory Workers (US$)[4]			
				Metal Mining (SIC 10)	Primary Non-ferrous Metals (SIC 333)	Chemicals and Allied Products (SIC 28)	Electric and Electronic Equipment (SIC 36)
Ann. Avg. 1970[5][7]	110.0	116.3	91.36	3.88	3.87	3.69	3.28
Ann. Avg. 1971[5][7]	114.1	121.3	96.02	4.12	4.15	3.97	3.49
Ann. Avg. 1972[5][7]	117.9	125.3	100.00	4.56	4.59	4.26	3.71
Ann. Avg. 1973[5][7]	125.9	133.1	105.80	4.84	4.98	4.51	3.91
Ann. Avg. 1974[5][7]	153.8	147.7	116.02	5.44	5.63	4.88	4.21
Ann. Avg. 1975[5][7]	171.5	161.2	127.15	6.13	6.24	5.39	4.64
Ann. Avg. 1976[5][7]	182.4	170.5	133.71	6.76	6.87	5.91	4.96
Ann. Avg. 1977[5][6][7]	195.1	181.5	141.70	7.28	7.67	6.43	5.39
Ann. Avg. 1978[5][6][7]	209.4	195.4	152.05	8.23	8.56	7.02	5.82
Ann. Avg. 1979[6][7]	236.5	217.4	165.46	9.27	9.50R	7.60	6.32
Ann. Avg. 1980	274.5	246.8	177.36	10.27R	10.63R	8.30R	6.95R
Apr 1980	271.3	242.5	–	10.01R	10.31R	8.13R	6.78R
May 1980	271.9	244.9	–	10.19R	10.38R	8.18R	6.77R
Jun 1980	273.5	247.6	178.93	10.14R	10.70R	8.25R	6.86R
Jul 1980	276.2	247.8	–	10.24	10.83R	8.36R	6.95R
Aug 1980	278.2	249.4	–	10.39R	10.79R	8.40R	7.01R
Sep 1980	278.8	251.7	182.92	10.55R	10.95	8.47R	7.12R
Oct 1980	282.2	253.9	–	10.59R	11.01	8.53R	7.18R
Nov 1980	283.4	256.2	–	10.73	11.07	8.60R	7.27R
Dec 1980	286.6	258.4	183.98	10.84R	11.32	8.69R	7.38R
Jan 1981	291.5	260.5	–	10.91	11.31	8.74	7.41
Feb 1981	295.7	263.2	–	11.15	11.36	8.80	7.43
Mar 1981	299.6R	265.1	188.14	11.13	11.50	8.84	7.47
Apr 1981	302.8	266.8	–	11.30	11.63	8.94	7.51
May 1981	304.1	269.0	–	11.26	11.68	8.99	7.55
Jun 1981	304.7	271.3	–	11.30P	11.87P	9.08P	7.57P
Jul 1981	306.0P	274.4P	191.17	–	–	9.16P	7.53P

P = Preliminary R = Revised since last month

(1) US Bureau of Labor Statistics, Washington, D.C.; "Producer Prices and Price Indexes," Table 6 (formerly "Wholesale Prices and Price Indexes"). Producer Price Indexes are revised four months after they are first released to reflect the availability of late reports and corrections by respondents.

(2) US Bureau of Labor Statistics, Washington, D.C.; Consumer Price Index for All Urban Consumers, US City Average, All Items.

(3) US Department of Commerce, Washington, D.C.; Bureau of Economic Analysis, National Income and Wealth Division; "Survey of Current Business," Table A. The GNP Implicit Price Deflator is published quarterly, and seasonally adjusted.

(4) US Bureau of Labor Statistics, Washington, D.C.; "Employment and Earnings," Table C-2. All data based on 1972 revision of SIC Manual. Data for 1970-1976 are adjusted to the March 1977 benchmark. Data for January 1977 and beyond are adjusted to the March 1979 benchmark.

(5) Monthly data 1970-1978 for Price Indexes and Employment and Earnings SIC-codes 10, 333, and 28, and quarterly data for GNP Implicit Price Deflator appear on pages 4.6-4.8 of Nuexco Report 139.

(6) Monthly data 1977-1979 for Employment and Earnings SIC codes 10, 333, and 28 appear on page 33 of Nuexco Report 147.

(7) Monthly data 1970-1979 for Employment and Earnings SIC code 36 appear on page 23 of Nuexco Report 154.

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STATISTICAL DATA

AUSTRALIAN GOVERNMENT STATISTICS

	Price Index of Materials Used in Manufacturing Industry—All Groups (Year 1968-69 = 100.0)[1]	Weighted Average Minimum Weekly Wage Rates—Adult Males Australia Mining and Quarrying (A$)[2]
Annual Avg. 1970[3]	101.4	59.88
Annual Avg. 1971[3]	101.5	65.95
Annual Avg. 1972[3]	105.6	71.26
Annual Avg. 1973[3]	124.4	78.96
Annual Avg. 1974[3]	141.9	108.07
Annual Avg. 1975[3]	150.4	132.55
Annual Avg. 1976[3]	168.4	160.93
Annual Avg. 1977[3]	192.0	179.03
Annual Avg. 1978[3]	198.5	190.04
Annual Avg. 1979	248.8	196.34
Annual Avg. 1980	321.8	217.96R
Apr 1980	328.4	215.14
May 1980	335.6	214.81
June 1980	338.8	214.16R
Jul 1980	347.8	221.51R
Aug 1980	352.0	220.08R
Sep 1980	350.3	219.60R
Oct 1980	348.2	221.13R
Nov 1980	350.4	221.49R
Dec 1980	351.7	221.81R
Jan 1981	357.8	229.96R
Feb 1981	356.6	229.79R
Mar 1981	355.2	229.03R
Apr 1981	354.6	228.75R
May 1981	353.4	236.67
Jun 1981	360.3P	236.98P

P = Preliminary R = Revised since last month

(1) Australian Bureau of Statistics, Canberra; "Price Index of Materials Used in Manufacturing Industry" (Catalogue No. 6411.0), Table 3.
(2) Australian Bureau of Statistics, Canberra; "Wage Rates, Australia" (Catalogue No. 6312.0), Table 1. Figures for the latest fourteen months shown are subject to revision.
(3) Monthly data for 1970 through 1978 appear on pages 4.7 and 4.8 of Nuexco Report 138.

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STATISTICAL DATA

CANADIAN GOVERNMENT STATISTICS

	Industry Selling Price Index: Manufacturing (D 500000)[1,2] (1971 = 100.0)	Wage-earner Data: Average Hourly Earnings (C$)[3,4]		
		Metal Mining, including milling (SIC 050-059)	Primary Metal Industries, non-ferrous (SIC 296-298)	Chemicals and Chemical Products (SIC 370-379)
Annual Avg. 1977	174.3	8.18	6.50	6.51
Annual Avg. 1978	190.4	8.76	6.82	6.97
Annual Avg. 1979	217.9	9.60	7.35	7.67
Annual Avg. 1980	247.2	10.59	8.05	8.50
Apr 1980	241.1	10.40	7.94	8.36
May 1980	242.4	10.50	8.01	8.44
Jun 1980	243.7	10.51	8.07	8.46
Jul 1980	246.3	10.49	8.11	8.55
Aug 1980	249.4	10.58	8.14	8.65
Sep 1980	252.0	10.85	8.24	8.71
Oct 1980	256.0	11.05	8.28	8.82
Nov 1980	257.7	11.11	8.38	8.77
Dec 1980	258.4	11.13	8.32	8.92
Jan 1981	263.3	11.27	8.51	8.90
Feb 1981	263.6	11.43	8.59	9.00
Mar 1981	265.4	11.47	8.63	9.17
Apr 1981	267.7	11.72P	8.76P	9.33P
May 1981	269.6	–	–	–
Jun 1981	271.9P	–	–	–

P = Preliminary R = Revised since last month

(1) Statistics Canada, Prices Division, Ottawa; "Industry Price Indexes" (Catalogue 62-011), Table 1. Indexes for the most recent six months shown are subject to revision.
(2) Monthly data for 1973 through 1978 appear on page 4.10 of Nuexco Report 138.
(3) Statistics Canada, Labour Division, Employment and Payrolls Section, Ottawa, "Employment, Earnings and Hours" (Catalogue 72-002), Table 2.
(4) Monthly data for 1977 and 1978 appear on page 4.11 of Nuexco Report 138.

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STATISTICAL DATA

REPUBLIC OF SOUTH AFRICA STATISTICS

	Average Declared Working Costs per Metric Ton of Gold Ore Milled (Rand)[1]	Consumer Price Index[2] (1975 = 100, except where otherwise indicated)	Wholesale Price Index All Groups (1975 = 100)	Total Employment in Mining and Quarrying (Code 35)[5]	Total Salaries and Wages in Mining and Quarrying (1,000 Rand) (Code 40)[5]
Annual Avg. 1970[3]	7.34	100.3[4]		655,346	399,164
Annual Avg. 1971[3]	7.88	106.4[4]	59.1	652,294	415,956
Annual Avg. 1972[3]	8.79	113.3[4]	63.9	623,067	443,933
Annual Avg. 1973[3]	10.51	124.1[4]	72.3	684,743	572,133
Annual Avg. 1974[3]	13.18	138.5[4]	85.3	674,140	761,596
Annual Avg. 1975[3]	16.71	157.2[4]	100.0	639,473	1,003,617
Annual Avg. 1976[3]	19.30	174.7[4]	115.1	671,240	1,212,983
Annual Avg. 1977[3][6]	23.87	194.4[4]	130.0	712,006	1,420,670
Annual Avg. 1978[3][6]	27.14	137.2	142.7	664,571	1,537,169
Annual Avg. 1979[3][6]	30.18	155.3	164.5	692,209	1,830,632
Annual Avg. 1980[6]	35.53	176.7	192.1	714,379	2,279,615
Apr 1980	–	170.0	184.2	710,652	169,415
May 1980	–	171.9	187.0	717,171	179,128
Jun 1980	34.48	174.6	189.0	714,379	183,739
Jul 1980	–	177.2	192.7	715,460	202,403
Aug 1980	–	179.2	196.8	716,486	206,514
Sep 1980	36.19	182.8	199.8	710,889	204,761
Oct 1980	–	186.3	203.1	720,246	204,602
Nov 1980	–	187.8	205.6	716,797	208,345
Dec 1980	37.69	189.9	206.5	705,087	211,829
Jan 1981	–	191.0	207.2	729,575	219,969
Feb 1981	–	193.8	209.8	725,647	210,275
Mar 1981	39.26	195.2	209.9	705,010	210,151
Apr 1981	–	196.4	211.6	719,674	217,124
May 1981	–	197.7	213.2	726,869	219,880
Jun 1981	40.41	200.0	215.3	728,506	237,049
Jul 1981	–	204.6	218.4	–	–

(1) Chamber of Mines of South Africa, Johannesburg; "Analysis of Working Results," published quarterly.
(2) Republic of South Africa Department of Statistics, Pretoria; "Government Gazette: Consumer Price Index for Urban Areas."
(3) Historical data for the Average Declared Working Costs and Consumer Price Index 1970-1979 appear on page 4.9 of Nuexco Report 140.
(4) April 1970 = 100.00.
(5) Bulletin of Statistics, Department of Statistics, Pretoria.
(6) Historical data for Codes 35 and 40 1977-1980 appear in this report.

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STATISTICAL DATA

REPUBLIC OF SOUTH AFRICA STATISTICS

Total Employment in Mining and Quarrying (Code 35)[1]

Month	1980	1979	1978	1977
Jan	699,112	664,394	620,146	623,207
Feb	705,758	680,054	660,111	702,511
Mar	708,456	689,770	658,059	706,614
Apr	710,652	682,505	660,075	700,532
May	717,171	689,749	666,478	715,410
Jun	714,379	692,209	664,571	712,006
Jul	715,460	699,567	670,164	707,953
Aug	716,486	692,377	673,505	707,521
Sep	710,889	686,248	670,864	713,117
Oct	720,246	692,859	675,595	707,092
Nov	716,797	699,158	674,717	692,430
Dec	705,087	697,741	662,418	663,668
Ann Avg.	714,379	692,209	664,571	712,006

Total Salaries and Wages in Mining and Quarrying (Code 40)[1] (R 1000)

Month	1980	1979	1978	1977
Jan	171,548	137,630	117,298	104,876
Feb	165,790	136,252	116,252	108,702
Mar	171,573	139,717	121,582	114,713
Apr	169,415	143,812	116,945	117,467
May	179,128	146,732	124,990	118,499
Jun	183,739	152,862	126,343	118,114
Jul	202,403	161,450	134,330	117,022
Aug	206,514	159,514	136,428	121,280
Sep	204,761	158,804	132,700	125,491
Oct	204,602	162,721	135,434	125,597
Nov	208,345	165,956	136,928	124,607
Dec	211,829	165,182	137,561	124,366
Ann. Avg.	2,279,615	1,830,632	1,537,160	1,420,670

(1) Bulletin of Statistics, Department of Statistics, Pretoria.

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MARKET OPPORTUNITIES

Market Opportunities are *active* inquiries in the uranium market to buy, sell, borrow or lend. The data presented in this section are in no way intended to be indicative of the entire uranium market for the time period covered.

URANIUM SUPPLY

Nuexco Reference Number	Delivery Period* (Thousands of Pounds U_3O_8) 0 to 1 Year	1 to 2 Years	2 to 3 Years	Remarks
Available for Sale:				
1393			350	
1475	1100			UF_6
1480	200	300	300	
1490	1100			
1550	600			
1562			150	Long Term
1575			500	Long Term
1581	100	150	150	Long Term
1600			200	Long Term
1610	300	100		
1637	500	500		
1678		275		
1684	500			
1685	100			
1698	130			
1727	500			
1730	30			
1738	750			UF_6
1740	500			
1741	500			
1742	200			
1743	100			
TOTAL:	7210	1325	1650	
Available for Loan:				
1429	300			UF_6
1646	275	275	275	
1695	225	325	325	UF_6
1742	500			
TOTAL:	1300	600	600	

***Measured from the date of this Report.**

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MARKET OPPORTUNITIES

Market Opportunities are *active* inquiries in the uranium market to buy, sell, borrow or lend. The data presented in this section are in no way intended to be indicative of the entire uranium market for the time period covered.

URANIUM DEMAND

Nuexco Reference Number	Delivery Period* (Thousands of Pounds U_3O_8) 0 to 1 Year	1 to 2 Years	2 to 3 Years	Remarks
Inquiries to Purchase:				
1459			200	Long Term
1462			100	Long Term
1603		100	100	Long Term
1634	400	400		
1636	200	200	200	
1650	220			
1699	1000			
1704		200	200	Long Term
1706	250			
1724	600	500	500	Long Term
1731	250			
1732	50			
1733	1000			
TOTAL:	3970	1400	1300	
Inquiries to Borrow:				
1621	300			
TOTAL:	300			

***Measured from the date of this Report.**

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MARKET OPPORTUNITIES

Market Opportunities are *active* inquiries in the secondary market for UF_6 conversion services. The data presented in this section are in no way intended to be indicative of the entire market for the time period covered.

CONVERSION SUPPLY

Nuexco Reference Number	Delivery Period* (Thousands of Pounds U as UF_6) 0 to 1 Year	1 to 2 Years	2 to 3 Years	Remarks
1451	75			
1607	900			
1609	500	1500	1000	Long Term
1619		200	100	
1661		400	400	Long Term
1684	450			
TOTAL:	1925	2100	1500	

CONVERSION DEMAND

Nuexco Reference Number	Delivery Period* (Thousands of Pounds U as UF_6) 0 to 1 Year	1 to 2 Years	2 to 3 Years	Remarks
1594		400	950	Long Term
1622		400	400	Long Term
1722	450			
TOTAL:	450	800	1350	

*Measured from the date of this Report.

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EXECUTIVE SUMMARY & INDUSTRY OVERVIEW
NUEXCO REPORT 157

The **Exchange Value** remained at $23.50 per pound U_3O_8 for the second consecutive month. Over one million pounds U_3O_8 is under serious negotiation at prices near current Exchange Value. In addition, many sellers are offering or appear willing to offer large amounts of material at this level.

Near term supply and near term demand are approaching the same order of magnitude for the first time in many months. Active inquiries to sell in the spot and near term market increased this month and amount to 7.2 million pounds U_3O_8 equivalent. The total of inquiries to purchase in the same time frame nearly tripled to four million pounds U_3O_8.

Inventory holders continue to comprise over half of the sellers with available near term material. However, utilities have responded to the current low price of material and make up 60 percent of the purchasers actively seeking material in the near term. A continuation of this trend could have a strengthening effect on the market.

Four uranium transactions are reported this month. Three of the transactions involve a total of about three-quarters of a million pounds U_3O_8 for delivery in 1981 and 1982. The fourth transaction is a long term contract for between three and six million pounds U_3O_8. Deliveries are spread out over a ten year period beginning in 1984. The **Transaction Value** decreased slightly to $24.30 per pound U_3O_8. This month's calculation includes ten transactions over the past five months. The **Loan Use Charge Rate** remained at last month's level of 5½ percent.

The near term market for secondary conversion services remains thin with limited buyer interest. The **Conversion Value** dropped to $1.10 per pound U from last month's level of $1.15 per pound U. Inventory sellers must offer attractive prices to "deconvert" UF_6 to U_3O_8 in order to move their material. There are no secondary market conversion transactions reported this month.

All uranium extracted from Saskatchewan Crown lands in Canada is subject to that province's royalty tax. The royalty system has two components, a basic royalty and a graduated royalty. A detailed look at the method of calculation and payment of the royalties is covered in this Report.

The *Essay* updates the list of signatories of the Treaty on the Non-Proliferation of Nuclear Weapons and reviews the International Atomic Energy Agency safeguards agreements and the participating nations.

The last installment of the three-part *Topical Essay* on unconventional transactions looks at the barter as a strategic tool.

The *Raw Materials* essay continues last month's report on Spain's nuclear program with an emphasis on the geological makeup of the country.

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OCTOBER 1981 NUMBER 158

Monthly Report on the Uranium Market

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MONTHLY REPORT ON THE URANIUM MARKET

October 1981 No. 158

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FOREWORD

We would like to take this opportunity to recognize the people behind the scenes at Nuexco, the Administrative Staff, for their tremendous contribution in all aspects of the organization. Seated from left to right: Marian Cruz, Linda Vogl, Doris Willbanks, Betty Bryant. Standing from left to right: Wendy Boyden, Kathie Kuziel, Dolores T. Fazzino, Alan Gemanis, Christie Maggard.

Enclosed with this Report is a copy of two speeches, one by Tom Boyden, one by Jerry Reaves, presented at the Society of Mining Engineers, 5th Annual Uranium Seminar on September 20-23, 1981 in Albuquerque, New Mexico.

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URANIUM MARKET

GENERAL

Forecast of Uranium Production

This Report presents Nuexco's latest forecast of uranium production for the world outside Communist areas (WOCA). Those forecasts are quantified in Tables 1, 2 and 3. Table 1 summarizes Nuexco's forecast of US production of U_3O_8 for centers operating or under construction as of September 30, 1981. Table 1 also shows Nuexco's estimate of U_3O_8 produced in 1981 by plants which have been shut down this year. Table 2 shows Nuexco's forecast of world U_3O_8 production by region; Table 3 contains the same production estimates segmented according to status of the production center.

Production centers are divided into categories, according to stage of development, as follows:

1. Operating production centers — those which have shipped U_3O_8 in commercial quantities on or before September 30, 1981.

2. Production centers under construction — those which were being built as of September 30, 1981, and which have an established access to ore reserves. Conventional production centers are included in this category only if mill construction has actually begun.

Each category is further divided, according to source, as follows:

— Conventional milling

— Unconventional recovery methods:

Solution mining, including *in situ* leaching and hydraulic mining

Phosphoric acid by-product recovery

Heap leaching, including leachings of tailings and copper dumps.

Annual US production is expected to decline from the 1980 peak of 42.5 million pounds U_3O_8 to about 37 million pounds U_3O_8 in 1981, approximately the same as 1979. That conclusion is consistent with those of DOE and other analysts. However, Nuexco expects US production to decline to less than half the 1980 level, 20 million pounds U_3O_8, by 1984 and to stabilize at 14-16 million pounds per year in the second half of this decade. The decrease is due to declining ore grades, depletion of orebodies and production cutbacks due to high costs and low prices.

While the forecast of uranium production presented in Nuexco Report 147 underestimated the time required for US producers to respond to declining market prices, the forecast presented in this Report has taken into account that inertia. As a result, the production estimate for 1981 exceeds that of Report 147 by eight million pounds U_3O_8.

Nuexco's forecast of WOCA uranium production shows the total annual production for 1981 at 111 million pounds U_3O_8, and 1982 at about 110 million, essentially the same as 1980. For the rest of the decade, total annual production is forecast to decline slightly, remaining in the range of 104 to 108 million pounds U_3O_8 for 1983-1990. As US production declines, other production will increase, so that the US portion of the total declines steadily from 38 percent in 1980 to 17 percent in 1985. For the balance of the decade, the US

Table 1

US URANIUM PRODUCTION FORECAST
(Millions of Pounds U_3O_8)

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Operating										
Conventional Mills	28.7	19.6	15.9	14.1	12.7	9.7	9.7	9.3	9.3	8.8
Unconventional Sources	7.2	7.7	6.8	5.5	5.1	5.1	5.1	5.1	5.1	4.3
Subtotal	35.9	27.3	22.7	19.6	17.8	14.8	14.8	14.4	14.4	13.1
Under Construction (as of 9/30/81)	0.3	0.6	0.7	0.7	0.7	0.7	0.5	0.5	0.5	0.5
Shutdown or Cancelled (as of 9/30/81)	1.0	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
TOTAL (rounded)	37	28	23	20	19	16	15	15	15	14

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URANIUM MARKET

Table 2

WORLD URANIUM PRODUCTION FORECAST[1]
(Millions of Pounds U_3O_8)

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Australia	7.1	12.1	12.1	11.2	9.4	8.4	8.4	8.4	8.4	8.4
Canada	20.0	21.0	19.7	23.6	26.7	26.7	28.2	32.2	32.2	32.2
Niger, Gabon	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9
France	5.5	6.7	7.1	7.6	7.6	7.6	7.6	7.6	7.6	7.6
Namibia	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Republic of South Africa	15.9	16.6	17.7	18.4	18.4	18.1	17.9	17.8	17.8	17.7
Other Nations[2]	1.4	1.6	2.7	2.9	3.4	3.1	3.4	3.4	3.4	3.4
Non-US Total	73.8	81.9	83.2	87.6	89.4	88.1	89.4	93.3	93.3	93.3
US[3]	37.2	27.9	23.5	20.4	18.5	15.6	15.4	14.9	14.9	13.6
TOTAL (rounded)	111	110	107	108	108	104	105	108	108	107

[1]Outside Communist Areas
[2]Argentina, Belgium, Brazil, Chile, Portugal, Spain and others
[3]This Report, Table 1

fraction declines very slowly to only 13 percent in 1990.

The reasons behind Nuexco's forecast of declining US production have been detailed in previous Reports. However, the reasons for other producers' ability to expand production at the same time bear repeating. The reasons include:

1. The continuing decline in spot market prices has affected uranium producers in the rest of the world more slowly and to a lesser extent than in the US.

2. These effects have so far been limited to a few commercial producers of uranium, as opposed to captive producers.

3. Some older non-US production facilities can be expected to phase out due to the same pressures of high cost and low grade which affect US producers, but the resulting decreases in production will be more than offset by new production from high-grade reserves in Canada and Australia.

4. Production arising from facilities captive to aggressive national nuclear power programs will also help to offset the forecast decline in US production. Active promotion of nuclear power by the governments of several nations allows them to use longer planning horizons than their US counterparts. Additionally, much of the important production outside the US is dedicated to attaining and sustaining national self-sufficiency in the nuclear fuel cycle, or at least in nuclear raw materials. For these reasons, much of what might otherwise be excess or economically marginal uranium production outside the US will continue in operation.

The forecast of world production presented herein necessarily reflects some subjective opinions about commercial decisions which will be faced over the next few years by uranium producers. The decisions include whether to:

1. Continue funding some projects already under construction;

2. Expand exploration programs, terminate them or to continue them at some intermediate level;

3. Postpone or terminate planned expansions;

4. Continue uneconomic or marginal mining and milling operations in the hope of near term improvement in the spot market price;

5. High-grade where possible, in effect sacrificing mine life for short-term improvements in average cost of production;

6. Divest themselves of less attractive mining or milling operations;

7. Withdraw altogether from uranium mining and milling.

Those decisions will be based on many factors, but the ultimate outcome of production decisions will most probably be determined by the economics of free

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URANIUM MARKET

Table 3

WORLD URANIUM PRODUCTION FORECAST[1]
(Millions of Pounds U_3O_8)

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Operating										
US	36.9	27.3	22.7	19.6	17.8	14.8	14.8	14.4	14.4	13.1
Non-US	73.7	73.1	72.8	71.8	67.3	65.0	66.2	66.2	66.1	66.3
Subtotal	110.6	100.4	95.5	91.4	85.1	79.8	81.0	80.6	80.5	79.4
Under Construction										
US	0.3	0.6	0.7	0.7	0.7	0.7	0.5	0.5	0.5	0.5
Non-US	0.1	8.8	10.4	12.1	13.6	13.6	13.6	13.6	13.6	13.6
Subtotal	0.4	9.4	11.1	12.8	14.3	14.3	14.1	14.1	14.1	14.1
Planned										
US	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
Non-US	-0-	-0-	-0-	3.6	8.4	9.6	9.6	13.6	13.6	13.6
TOTAL (rounded)	111	110	107	108	108	104	105	108	108	107

[1]Outside Communist Areas

market competition except for certain producers captive to electric utilities or national nuclear power programs.

The Sixth Annual Symposium of the Uranium Institute took place in London last month. Over 350 participants representing 26 countries attended the sessions. In the past, the Institute has been viewed as primarily a non-US group, but with the resolution of the legal problems in the uranium industry, there is a growing exchange of ideas and involvement by US organizations.

In a major policy address at the Institute Symposium the US Assistant Secretary of State outlined changes in the US government position concerning the export of enriched uranium and nuclear equipment. Under the new policy, the US Department of Energy (DOE) will abolish case-by-case approvals for the transfer of spent fuel and reverse US policy established under the Carter Administration to stop civil reprocessing and breeder reactor development abroad. The new policy will encourage reprocessing and the breeder reactor in countries with advanced nuclear power programs where it does "not constitute a proliferation risk." On uranium matters, the Assistant Secretary confirmed that DOE does not see the need to alter the current phasing out of uranium import restrictions.

AUSTRALIA

Australia has signed a nuclear safeguards agreement with the European Atomic Energy Community (Euratom) designed to ensure that exports of Australian uranium to Euratom member states will be carried out in accordance with Australia's nuclear safeguards policy. The agreement will come into force following the exchange of diplomatic notes. Although the accord does not cover transfers of nuclear material from Euratom members to Australia, member states which do not have bilateral agreements with Australia have agreed in side-letters that they are prepared to enter into discussions about supplementary agreements if and when appropriate.

The Uranium Enrichment Group of Australia (UEGA) is pressing ahead with its feasibility study for an Australian enrichment plant. Its next report, expected some time next year, will be making recommendations on the preferred technology. Should it be decided to pursue the recommendations, questions of location and protective measures as well as the environmental and social impact of the proposed

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plant will come under closer examination.

It was announced this month that the Australian government had approved a long term sale by Queensland Mines Ltd. to Electricité de France. The contract price is market related, subject to the Australian floor price guidelines. The transaction involved 5.2 million pounds U_3O_8 for delivery between 1982 and 1988.

CANADA

Western Canada appears to be a beneficiary of the uranium price drop which has taken place over the last 20 months. In recent months, Saskatchewan producers have either signed or are very close to completing several long term sales agreements. The bulk of these are with US buyers.

As a result of low spot prices and the near term bleak price outlook, very few US producers are offering material. Australian and South African producers are participating in the market to some degree, but the Canadians have had the most success. US buyers have, on numerous occasions, voiced strong preferences for North American yellowcake. Some of these agreements extend ten years or more and the contractual terms are such that the sellers will profit by market improvements. These are not distress sales nor distress purchases. These contracts were negotiated in a clear buyer's market.

Since additional US buyers in particular are expected to be interested in concluding long term purchase agreements over the next few months, the selling pace of Canadian producers may well continue throughout 1982.

EUROPE

In France, the public debate on nuclear power promised by President Mitterrand upon his election will take place in Parliament in early October. Most observers do not expect a radical change in France's nuclear power program, but only a slowdown of plant orders for the second half of the decade. This debate will be followed anxiously by the world's nuclear industry, since France has been the leading example of a nation's commitment to, and successful implementation of, nuclear power policies.

At present, the intention of the Mitterrand government is that all nuclear plants currently under construction will go ahead. Thus there will be no cutback in installed capacity through about 1986. Of the plants which are planned, but not yet under construction, the government plans to cut back by about one third. In the 1982-1983 time period, the previous government had planned to order eight 1300 MWe units and one 900 MWe unit. The sites for the 1300 MWe units were Cattenon (two units), Chooz (two units), Golfech (two units), Penly (one unit) and Nogent sur Siene (one unit). The 900 MWe unit was to be at Chinon. Thus three of the eight 1300 MWe will probably not be ordered in the 1982-83 time frame if the government's intentions are carried out. The government's program must be approved by the French National Assembly, and it is likely that the cutbacks will be accepted due to a recent downward revision in forecast electricity demand in France.

FAR EAST

In previous Reports Nuexco has reviewed and commented upon Japan's nuclear power program and the resultant demand for uranium as follows:

1. Japan's official government forecast calls for 51,000-53,000 MWe of nuclear generation by 1990 and 74,000-78,000 MWe by 1995.

2. If such levels were attained, Japan's utilities would need additional uranium supplies beginning in 1990, and could be expected to begin procurement activity well before that date.

3. Nuexco believes that the government planning is overly optimistic and believes that placing 40,000 MWe nuclear into operation by 1990 would be a commendable performance.

The foundation of Nuexco's opinion is outlined in Table 4 which depicts, on a year by year basis, actual utility planning, based on the realities of site procurement, environmental and safety evaluation and plant construction schedules. It should be noted that, even now, several plants included on this list for operation in the late 1980's still lack site definition and are categorized as "new" sites. The total utility planned 27 units and 25,240 MWe, when added to existing capacity of 23 units and 15,700 MWe, produces grand totals of 50 units and 40,640 MWe.

It will be recalled that the Japan-Australia Uranium Resource Development Company (JAURD) holds an equity interest in Energy Resources of Australia (ERA)

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Table 4

JAPAN UTILITY PLANS FOR ADDITIONAL NUCLEAR GENERATION
1981 - 1990
(Capacity in MWe)

Year	PLANT NAME MWe Capacity — Utility (See Note)							Total MWe by Year
Prior to 1981	22 reactors 15,141							15,141
1981	Genkai-2 559-KYU							559
1982	Ikata-2 556-SHIK	Fukushima 2-1 1100-TEPCO						1666
1983								0
1984	Fukushima 2-2 1100-TEPCO	Onagawa 524-TOH	Kawauchi-1 890-KYU					2514
1985	Takahama-3 826-KEPCO	Fukushima 2-3 1100-TEPCO	Takahama-4 826-KEPCO					2752
1986	Fukushima 2-4 1100-TEPCO	Hamaoka-3 1100-CHUBU	Tsuruga-2 1160-JAPC	Kawauchi-2 890-KYU	Kashiwazaki-1 1100-TEPCO			5350
1987								0
1988	*"New"* Site 1200-KEPCO							1200
1989	Ikata-3 890-SHIK	Kashiwazaki-2 1100-TEPCO	*"New"* Site 1200-KEPCO	Maki 825-TOH	Shimane-2 820-CHU	Kyowatomari-1 579-HOKK		5414
1990	Kyowatomari-2 579-HOKK	Noto 540-HO	*"New"* Site 1100-TEPCO	Shimokita-1 1100-TEPCO TOH	*"New"* Site 1100-CHUBU	Kashiwazaki-5 1100-TEPCO	Namie-Odaka 825-TOH	6344
TOTAL								25,240

Note: Utility Abbreviations: TEPCO (Tokyo Electric), KEPCO (Kansai Electric), CHUBU (Chubu Electric), SHIK (Shikoku Electric) CHU (Chugoku Electric), KYU (Kyushu Electric), TOH (Tohoku Electric), HOKK (Hokkaido Electric), HO (Hokuriku Electric), JAPC (Japan Atomic Power).

(the Ranger project). The participants in JAURD are

Kansai Electric Power Co.	50%
Kyushu Electric Power Co.	25%
Shihoku Electric Power Co.	15%
C. Itoh	10%

JAURD will receive about two million pounds U_3O_8 annually from ERA beginning in 1982, and it is anticipated that each utility company will take its pro-rata share. C. Itoh must, of course, sell its portion, and it is presently thought that such share will be taken up by Kansai.

UNITED STATES

On September 25 the US Senate Subcommittee on Energy Research and Development under the Committee on Energy and Natural Resources held a preliminary hearing. The purpose of the hearing was to

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examine the viability of the domestic uranium mining and milling industry. Senator Pete V. Domenici of New Mexico as Chairman of the Subcommittee heard testimony from participants including representatives from the US Department of Energy (DOE), Energy Information Agency (EIA), Department of State, and several US uranium firms.

Under Section 161v of the Atomic Energy Act of 1954, DOE is charged with "assuring the maintenance of a viable domestic industry." One method available to do this is by restricting the amount of foreign uranium enriched in the US for domestic use. Such restrictions were placed in 1964. In 1974, the Atomic Energy Commission decided to gradually remove the limitations. Currently, the limitation is 40 percent non-US, scheduled to increase to 60 percent in 1982 and 100 percent in 1984.

Senator Domenici had previously requested two studies on the viability of the US uranium industry. The studies were *The Domestic Uranium Industry and Imports of Uranium* (February 23, 1981) by DOE and *The Impact of Various Federal Uranium Policies on the Uranium Market* (September 1981) by EIA. Both studies were referred to during the hearing.

Testimony was given by the following:

1. *DOE.* The DOE spokesman outlined the conclusion of the February 1981 Report requested by Senator Domenici. The DOE study concluded that "there does not appear to be any current need for any changes to the (restriction removal) plan." However, other speakers from the uranium industry commented that the DOE Report was out of date due to the major cutbacks and shutdowns in the uranium industry which have taken place in 1981.

2. *EIA.* The Administrator of the EIA in his testimony analyzed several US government policy options which would affect both the domestic and foreign uranium market. He concluded that "the dominance of natural market forces in the near term would be hard to overcome through any of these policy changes." The options which incorporated some type of import control were viewed as having the largest potential impact on prices and the industry as a whole in the longer term.

3. *State Department.* The State Department spokesman stressed free trade and the maintenance of a trusting reputation vis-a-vis important US trading partners such as Australia and Canada, also strong supporters of nuclear nonproliferation. He echoed the DOE statement that the lifting of the import restrictions was working well and that a revitalization of the nuclear power industry was the move needed to aid the uranium industry.

4. *Uranium producers.* The viewpoint of the uranium producers differed significantly from the government spokesman. While recognizing that the near term domestic industry problem does not stem from foreign imports, the threat of large quantities of foreign uranium in the long term translates into a US industry with little chance of recovery. They emphasized the need for strong industry support today in order to encourage decisions to continue production. An immediate 20 percent limitation on foreign uranium for enrichment for domestic use was advocated by spokesmen from major US producers.

Due to the budget discussions and voting taking place concurrently on the Senate floor, Senator Domenici was the only Subcommittee member present. Senators East (R-NC), Nichols (R-OK), Weicker (R-CT), Warner (R-VA), Ford (D-KY), Burnet Johnston (D-LA), Bumpers (D-AR), and Tsongas (D-MA) are the other subcommittee members, none of whom attended the hearing. However, Senators Wallop (R-WY) and Simpson (R-WY) were present for part of the hearing. Last year, Senator Domenici succeeded in convincing the Senate to add a rider to the fiscal 1981 energy appropriation bill limiting the enrichment of foreign uranium for domestic use in new enrichment contracts. However, the amendments to the Senate version of the bill were dropped in conference. Senator Domenici has not introduced similar legislation this year, but this hearing could help him build a case.

On a subject related to the Subcommittee hearings, US Secretary of the Interior James Watt addressed a gathering in Denver, Colorado at the 1981 American Mining Congress on September 28. Watt indicated he felt it his responsibility to assist in the orderly development of US natural resources. Watt pledged his efforts toward reducing the level of federal interference that now exists in the mining industry. Regarding the minerals contained on federally-owned land, Watt confessed that "we just don't know enough" about what the US potential may be and promised to push toward the more definitive answer to US strategic mineral needs and resources.

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URANIUM MARKET

PRICING

The **Exchange Value** as of September 30, 1981 is $23.50 per pound U_3O_8, unchanged from the two previous months. The most important factors considered in this month's Exchange Value were:

1. The majority of sellers which previously were willing to put downward pressure on the market by competing for the limited sales opportunities have either sold their material or have withdrawn from the market.

2. Although the market appears to be stronger relative to last month, the meeting level for buyers and sellers continues to be close to current Exchange Value.

3. Responses to a firm bid to buy have not indicated a willingness on the part of sellers to go below the level of current Exchange Value.

The near term supply/demand ratio continues to be less than two to one. Prior to this month the ratio has averaged about nine to one during 1981. Utilities are becoming more active as purchasers especially in the long term. While these factors reiterate the strengthening of the demand sector observed last month, the continued presence of large inventories and the general worldwide oversupply situation cautions against an overly optimistic view.

Material now available for sale with delivery in the near term, as listed in the *Market Opportunities* of this Report, totals 7.4 million pounds U_3O_8. Primary producers and holders of inventory each are offering about 50 percent of this material. Active inquiries to purchase in the same time frame amount to 4.1 million pounds U_3O_8. The amount of material sought by utilities represents approximately forty percent of the total demand.

The **Transaction Value** decreased to $23.90 per pound U_3O_8. This month's calculation included eleven transactions over the past four months. The first delivery of the long term contract between an Australian producer and a European buyer reported in the *Australian* section of this Report was not included in the Transaction Value sample. This transaction is priced at market price in effect at the time of delivery, subject to the Australian floor price. Even though the floor price will probably govern during the first year of delivery, the transaction was still omitted because only transactions which have an objectively determinable price are included in the Transaction Value sample. The **Loan Use Charge Rate** remained at 5½ percent.

CONVERSION

The **Conversion Value** remained at $1.10 per pound U for the second consecutive month. One secondary market conversion transaction is reported this month at a price a little below current Conversion Value.

As indicated in the *Market Opportunities* section of this report, there are no active inquiries to purchase secondary market conversion services in the near term. Sellers continue to offer secondary market conversion services at about the level of Conversion Value. The absence of buyers has led to stability in the level of offers since there is no immediate driving force to cut prices. There is some demand in late 1982 and beyond for secondary market conversion services from utilities that are without primary converter contracts and in need of conversion services at that time. However, these buyers currently do not have concentrates available to swap for UF_6; thus the deconversion swap is not possible at this time.

The total of secondary market conversion services available for sale in the near term is two million pounds U. Most sellers are holders of UF_6 inventory wishing to respond to U_3O_8 inquiries to purchase.

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TOPICAL ESSAY

THE BRIDGE TRANSACTION

The uranium market is in the somewhat curious position of having suffered a price drop of almost 50 percent in real terms in a general economic period when the major inflation indicators are rising at about ten percent and the prime rate is around 20 percent. The collective effect of these factors has been disastrous for many sellers of uranium. However, there is at least one way in which sellers can take advantage of the high interest rates. The term "bridge transaction" has been coined to describe this method, and it capitalizes upon the fact that different market participants assess the time value of money in different ways.

The basic concept is that by inserting an intermediary party and delaying the payment to the seller, the buyer can record a purchase price below market value while the seller can record a sale price above market value.

A bridge transaction might take place as follows: In the course of a negotiation an impasse is reached because the seller wishes to sell at a high price while the buyer wishes to purchase at a low price. A bridge transaction can circumvent this problem in some instances. Basically, an intermediary firm steps in to the transaction, and from an appearance standpoint, a three party transaction is created in which there are two different uranium prices.

Figure 1 demonstrates this concept visually. In Step 1, the Seller delivers the material to the Intermediary. The Intermediary immediately delivers the material to the Buyer. The Buyer pays the Intermediary upon delivery (or on any other prearranged payment schedule). Rather than immediately transferring the funds to the Seller, the Intermediary instead puts the funds in an investment vehicle. An escrow type arrangement may be put in place to satisfy any security concerns that the Seller may have.

After the funds in the investment vehicle have grown enough to give the Seller an acceptable price per pound, the funds are then transferred from the investment vehicle to the Intermediary firm and immediately to the Seller.

Example: On October 1, 1981 a Seller delivers 100,000 pounds U_3O_8 by book transfer to an Intermediary firm, which in turn delivers the material immediately to a Buyer. Also on October 1, the Buyer pays the Intermediary firm $2,300,000, which corresponds to a price of $23.00 per pound U_3O_8. The Intermediary firm invests the funds in an investment vehicle, which might be a combination of certificates of deposit, Treasury bills, and commercial paper, for a period of four months. The return on this investment is 16 percent.

Four months later, on February 1, 1982, the principal plus interest has grown to approximately $2,417,000, which corresponds to a price of $24.17 per pound U_3O_8. This sum is transferred from the investment vehicle to the Intermediary company, and immediately passed on to the Seller. Thus the Buyer records a purchase price which is less than the spot market price at the time of delivery, while the Seller records a price that is greater than the market price at the time of delivery.

The key element in this transaction is the Seller's perception of the time value of money compared to its need for a particular price. For some firms, receiving $23.00 per pound U_3O_8 today is exactly the same as receiving $24.17 four months from now. For these firms, a bridge transaction will have little application. However, there are firms and situations where there is a difference between these two price/payment schedules. Specifically:

A. Utilities which have purchased uranium at a particular price above the current market and now desire to sell. It may be difficult to receive management or Public Utility Commission approvals for a sale at a price less than the original purchase price.

B. Producers or utilities that wish to receive a price greater than market price in a stagnant or falling market. Some firms may not wish to be thought of as contributing to a depressed market. Also, it may be necessary for these firms to record a sale price equal to or greater than market price in order to receive management approval for the sale.

The bridge transaction is one more tool available to a uranium marketer. Although the seller application is more limited, almost any buyer may be able to take advantage of it.

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TOPICAL ESSAY

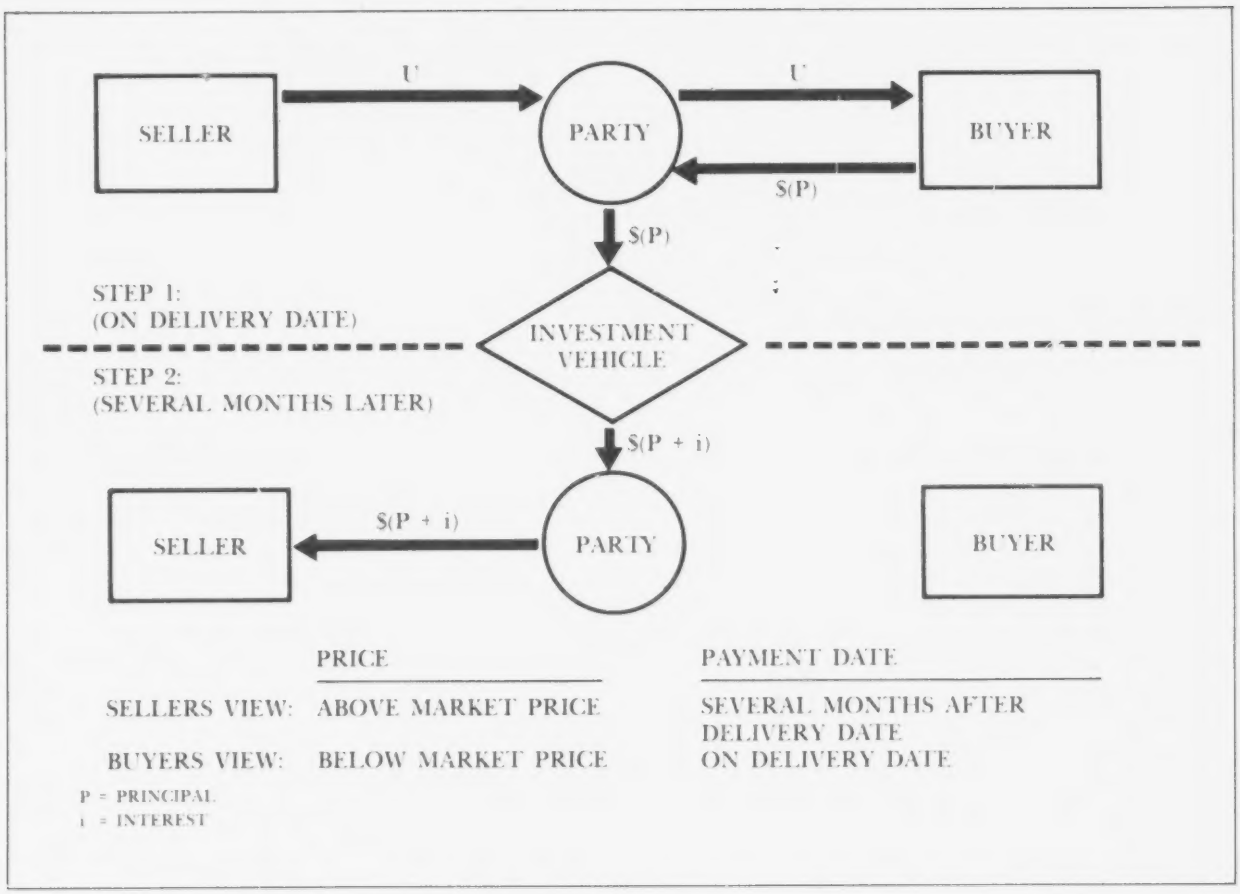

Figure 1

MOVEMENT OF URANIUM AND MONEY IN A BRIDGE TRANSACTION

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RAW MATERIALS

KEY LAKE PROJECT — PART I

On August 27, 1981, the Key Lake project was given the official green light to proceed with a mine and mill development program. The Key Lake Mining Corporation (KLMC) successfully negotiated the surface lease with the Department of Northern Saskatchewan (DNS) which allows KLMC access to and mining of the Key Lake deposits. The surface lease covers an area of approximately 25 square kilometers. As shown in Figure 2, Key Lake is situated near the contact of the Athabasca sandstone and the Wollaston Formation, along the southeastern portion of the Athabasca sedimentary structural basin. More precisely the project area is located at latitude 57° 12' north and longitude 105° 39' west.

The surface lease was the last condition of approval required before KLMC could initiate full scale development of the project. The purpose of the lease is to serve as an instrument of conveyance whereby KLMC assumes full obligation to operate within the project area under terms and conditions established by the Key Lake Board of Inquiry and DNS. Primarily it requires KLMC to operate the mining and milling project according to pre-determined consideration for environmental and regulatory requirements of Canadian and Saskatchewan law.

In addition to the above requirements, the surface lease specifies employment and contracting practices to be followed by KLMC. Permanent residents of northern Saskatchewan must make up 50 percent of the unskilled work force during the first year of construction, increasing to 60 percent of the construction and operating force thereafter. The skilled labor force will total 15 percent native personnel. Supervisory and administrative personnel must include ten percent residents of northern Saskatchewan. In order to integrate the natives throughout various levels of the work force, KLMC will initiate an on site apprentice training program for unskilled workers.

Contractors and support businesses already located in northern Saskatchewan will be granted job priority if their bid cost is not more than ten percent above bids by competitors from the southern districts of Saskatchewan. KLMC is required to make public an annual business plan which includes the type and content of contracts to be generated during any 12-month period. The purpose is to allow prospective bidders time to prepare their submittals.

Each of the above requirements will most likely add to project costs, especially during the construction period. However, the effect on overall production costs is expected to be minimized, thus eliminating any potential marketing disadvantage for KLMC.

Other priority requirements involve complete health and safety programs for all personnel including minimization of individual exposure time to radiation; monitoring and control of the socio-economic impact on the northern communities; and continued protection of the natural environment through the practical application of standards already established at other mines in the district.

The approved requirements of the surface lease closely parallel the recommendations of the five-member Key Lake Board of Inquiry as set forth in its January 1981 conclusion of the KLMC development plan. Project environmental and development plans were submitted to the Board of Inquiry in January 1980 after several years of preparation by KLMC. The Board, appointed by the Government of Saskatchewan, completed its study in December 1980 and the recommendation for acceptance by the government followed in January.

History of Exploration

During the 1970-71 period, anomalous radioactivity was discovered in the vicinity of Zimmer Lake during an airborne survey conducted by a joint venture. The venture participants were Bel Oil Corporation, Inexco Mining Company, both of the US, and Uranerz Exploration and Mining Limited (UEM), a firm associated with Uranerzbergbau GmbH of Bonn, Federal Republic of Germany. Follow-up evaluation on the ground resulted in the discovery of high-grade uranium and nickel-bearing boulders in glacial debris.

The exploration effort was immediately intensified to include detailed geochemical and geophysical surveys in an attempt to locate more mineralized boulders. Geologic mapping began in 1971 as a way to trace the boulders to the source area. More boulders were located on the north shore of Zimmer Lake in 1972. During the winter of 1972-73 test drilling was initiated in the area of the second boulder find. No traces of uranium were found in the eighteen holes drilled.

Exploration continued in a northeasterly direction to Seahorse Lake where more mineralized boulders were found on the north shore by detailed radiometric prospecting during the summer of 1973. Drilling was commenced once again during the winter of 1974-75. It

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RAW MATERIALS

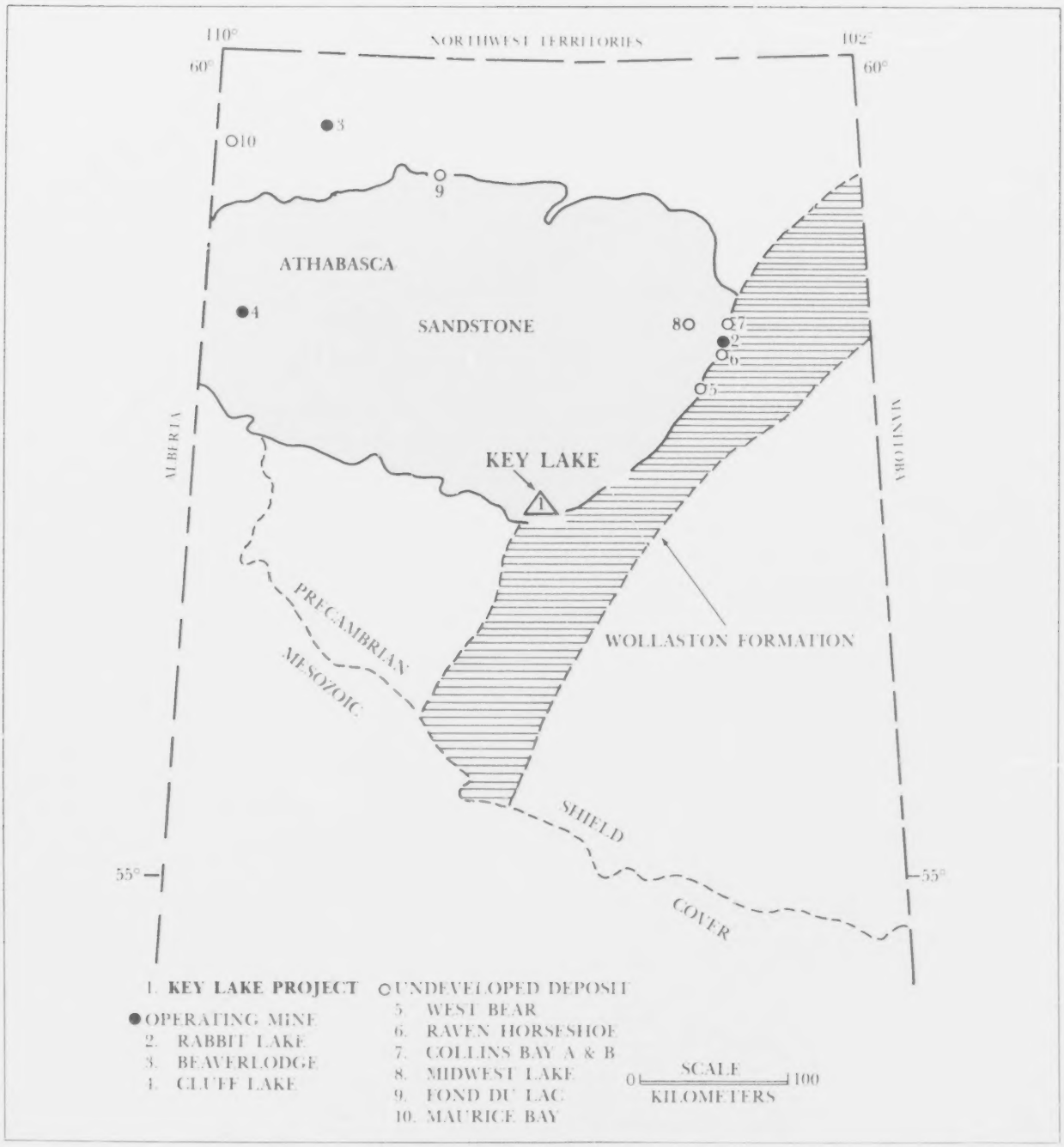

Figure 2

LOCATION OF THE KEY LAKE PROJECT WITH RELATION TO OTHER URANIUM DEPOSITS IN THE DISTRICT, NORTHERN SASKATCHEWAN

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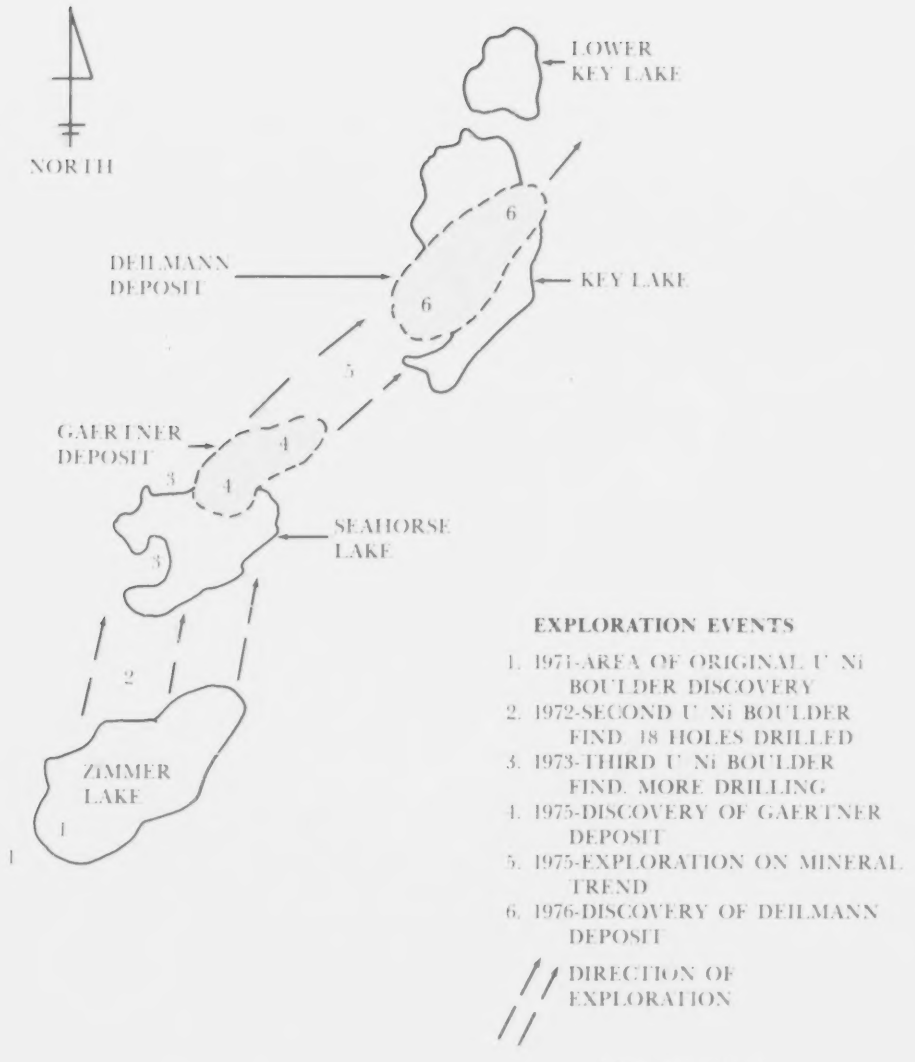

Figure 3

EXPLORATION CHRONOLOGY AND TRAVERSE SEQUENCE LEADING TO THE DISCOVERY OF THE KEY LAKE URANIUM DEPOSITS, NORTHERN SASKATCHEWAN

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was about mid-summer 1975 when ore-grade mineralization was intersected on the east shore of Seahorse Lake in the 25th test hole to be drilled. A sample taken from the core assayed over seven percent U_3O_8. The Gaertner orebody had been discovered.

Subsequent drilling outlined an orebody containing approximately 60 million pounds U_3O_8. Drilling continued along the northeast strike extension of the mineral zone and the Deilmann orebody was discovered one year later on the west shore of Key Lake less than one kilometer from the Gaertner orebody. The Deilmann deposit contains an estimated 121 million pounds U_3O_8. In addition, 11 million pounds U_3O_8 is contained in cobble ore overlying the main ore zone of the Gaertner deposit. KLMC considers approximately 155 to 170 million pounds U_3O_8 will be recovered at an average ore grade of 2.5 percent U_3O_8 during the projected 15-year life of the project. Figure 3 shows the exploration chronology and traverse sequence leading to the discovery of the Key Lake uranium deposits.

Property Ownership

The participants in the Key Lake project have changed since the early stages of exploration. Bel Oil sold its one-third interest in the joint venture to Saskatchewan Mining Development Corporation (SMDC) in 1974—before ore was discovered. SMDC is a corporation owned by the Government of Saskatchewan. It was established in 1974 to participate in the development of hard-rock mineral ventures in Saskatchewan and other provinces. Presently, SMDC participates in at lease 273 mineral ventures of which about 230 are primarily for uranium within Saskatchewan.

Inexco sold its one-third interest in the venture to SMDC in 1978. SMDC immediately sold one-half of the Inexco interest (16-2/3 percent) to Eldor Resources Limited (ERL) a wholly-owned subsidiary of Eldorado Nuclear Limited which is a Crown corporation owned by the Government of Canada. That transaction represents the last change in ownership. Equity interest in the project is now aligned as SMDC = 50 percent, UEM = 33-1/3 percent, and ERL = 16-2/3 percent. UEM was the designated operator of all exploration within the project area.

On March 1, 1979 the joint venturers formed KLMC, an operating company for the purpose of developing the ore deposits and operating all facilities. KLMC will also be responsible for continued exploration and evaluation of new ore discoveries within the surface lease area. Ownership of KLMC is in the same proportion as the joint venture interest.

NUEXCO

STATISTICAL DATA

EXCHANGE VALUE $23.50/lb U_3O_8
Determined as of September 30, 1981

Definition

The Exchange Value is Nuexco's judgment of the price at which transactions for significant quantities of natural uranium concentrates could be concluded as of the last day of the month.

Derivation

Nuexco bases the Exchange Value upon:

A. Data from recently completed transactions.

B. Data from pending transactions.

C. Firm bids to buy and firm offers to sell.

D. Prices purchasers have expressed a willingness to pay, but for which Nuexco is not aware of firm bids to buy, and prices sellers have expressed a willingness to accept, but for which Nuexco is not aware of firm offers to sell.

Comments

Nuexco does not consider the following in determining the Exchange Value:

A. The price of uranium delivered or to be delivered under old contracts.

B. The price of uranium delivered in connection with contract renegotiations or other than arm's length transactions.

TRANSACTION VALUE
Determined as of September 30, 1981

$ /lb U_3O_8	Millions of Pounds	Number of Transactions	Number of Months
23.90	2.8	11	4

Definition

The Transaction Value is a weighted average price of recent transactions, and is based on prices paid for U_3O_8 in transactions closed within the previous three-month period and for which delivery was scheduled within one year of the transaction date. At least ten transactions totaling at least two million pounds U_3O_8 are included in each calculation, or the sample time is extended as necessary to include these minima. Foreign currencies are converted to US dollars as of the transaction date.

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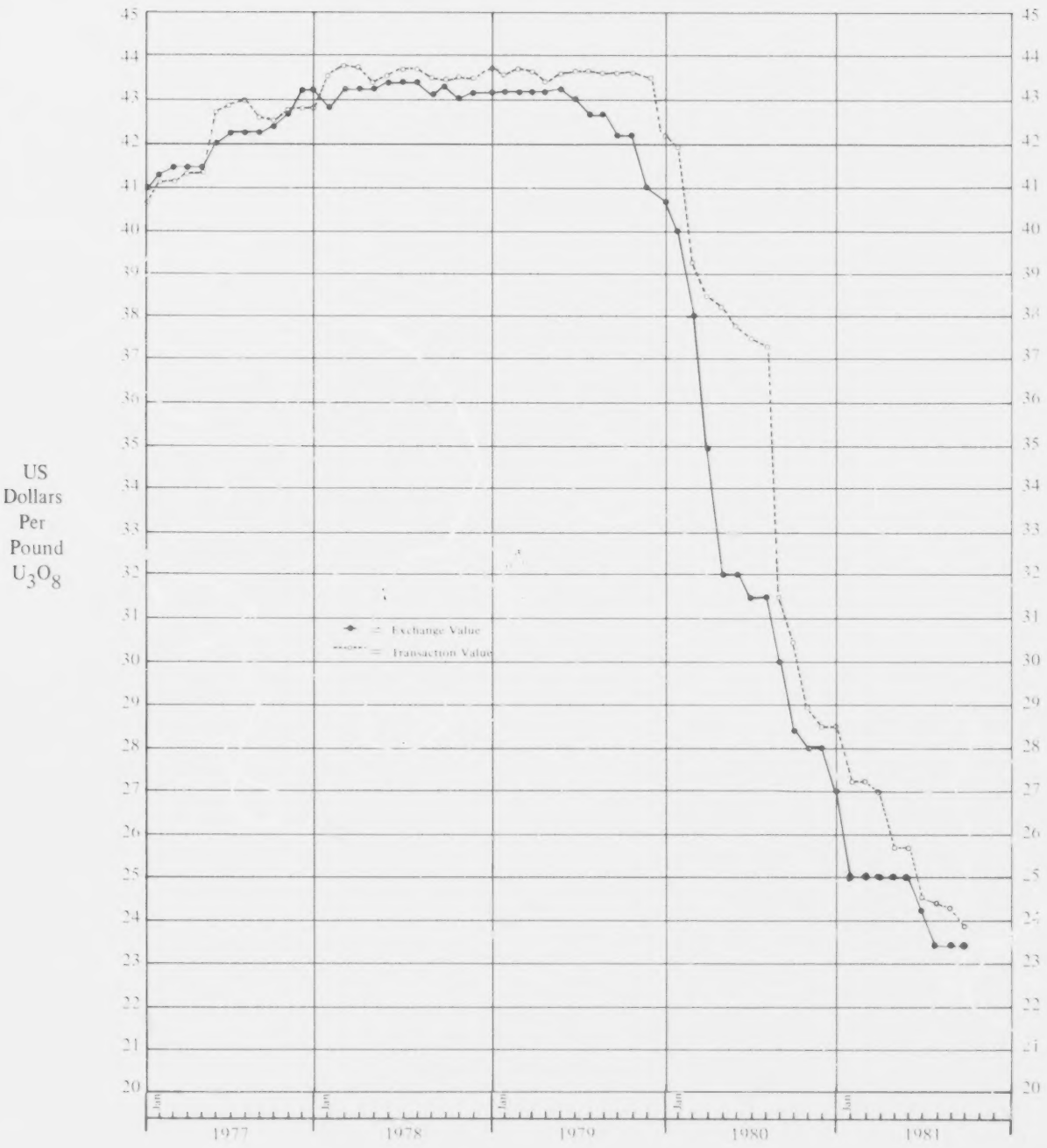
STATISTICAL DATA

EXCHANGE AND TRANSACTION VALUES
SINCE JANUARY 1977

Determined as of the last day of the month indicated



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STATISTICAL DATA

HISTORICAL EXCHANGE VALUES

Determined as of the last day of the month indicated (US Dollars lb. U_3O_8)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1968	–	–	–	–	–	–	–	6.35	6.35	6.40	6.45	6.50
1969	–	6.35	6.10	6.10	6.25	6.25	6.20	6.20	6.15	6.15	6.15	6.20
1970	6.30	6.30	6.30	6.30	6.30	6.30	6.30	6.20	6.15	6.15	6.15	6.15
1971	6.20	6.20	6.20	6.20	6.15	6.05	6.00	5.95	5.95	5.95	5.95	5.95
1972	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95
1973	5.95	6.00	6.10	6.20	6.45	6.50	6.50	6.50	6.50	6.50	6.75	7.00
1974	7.70	7.90	8.00	9.00	9.50	10.50	11.50	12.00	12.50	14.00	14.75	15.00
1975	16.00	16.00	18.00	20.00	21.00	23.00	24.70	26.00	26.00	28.50	30.00	35.00
1976	35.20	37.00	39.25	40.00	40.00	40.00	40.00	40.40	41.00	41.00	41.50	41.00
1977	41.35	41.50	41.60	41.60	42.00	42.25	42.25	42.25	42.40	42.75	43.20	43.20
1978	42.90	43.25	43.25	43.25	43.40	43.40	43.40	43.10	43.25	43.00	43.25	43.25
1979	43.25	43.25	43.25	43.25	43.25	43.00	42.70	42.70	42.20	42.20	41.00	40.75
1980	40.00	38.00	35.00	32.00	32.00	31.50	31.50	30.00	28.50	28.00	28.00	27.00
1981	25.00	25.00	25.00	25.00	25.00	24.25	23.50	23.50	23.50			

HISTORICAL TRANSACTION VALUES

Determined as of the last day of the month indicated (US Dollars lb. U_3O_8)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1976	–	–	–	–	39.60	39.70	39.70	40.40	40.30	40.60	40.70	40.70
1977	41.30	41.30	41.4[illegible]	41.50	42.80	42.90	43.00	42.60	42.50	42.80	42.90	42.90
1978	43.10	43.30	43.7[illegible]	43.60	43.60	43.20	43.30	43.40	43.40	43.60	43.40	43.70
1979	43.60	43.80	43.70	43.40	43.60	43.70	43.70	43.60	43.60	43.60	43.50	42.30
1980	42.00	39.30	38.60	38.40	37.90	37.60	37.30	31.60	30.60	29.00	28.70	27.70
1981	27.20	27.20	27.00	25.70	25.70	24.50	24.40	24.30	23.90			

EXCHANGE VALUE EXPRESSED IN SELECTED PRODUCER & CONSUMER CURRENCIES*

Country	per lb U_3O_8 in Concentrates	per kg U_3O_8 in Concentrates	per kg U in Concentrates
US (dollar)	23.50	51.81	61.09
France (franc)	130.34	287.35	338.85
FRG (mark)	54.36	119.84	141.32
Japan (yen)	5,461	12,040	14,198
Switzerland (franc)	46.32	102.13	120.43
UK (pound)	13.10	28.88	34.06
Australia (dollar)	20.55	45.31	53.43
Canada (dollar)	28.27	62.33	73.50
Niger, Gabon (CFA)	6,517	14,367	16,943
South Africa (rand)	22.46	49.51	58.38
Sweden (kröner)	131.51	289.92	341.88

*Calculated using currency exchange rates published in the Wall Street Journal on the last business day of the month.

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STATISTICAL DATA

CONVERSION VALUE $1.10/lb. U as UF_6
Determined as of September 30, 1981

Definition

The Conversion Value is Nuexco's judgment of the price at which spot and or near term transactions for significant quantities of conversion services could be concluded in the secondary market as of the last day of the month.

Derivation

Nuexco bases the Conversion Value upon:

A. Data from recently completed transactions.

B. Data from pending transactions.

C. Firm bids to buy and firm offers to sell.

D. Prices purchasers have expressed a willingness to pay, but for which Nuexco is not aware of firm bids to buy, and prices sellers have expressed a willingness to accept, but for which Nuexco is not aware of firm offers to sell.

Comments

Nuexco does not consider the following in determining the Conversion Value:

A. The price of conversion services delivered or to be delivered under old contracts.

B. The price of conversion services delivered in connection with contract renegotiations or other than arm's length transactions.

LOAN USE CHARGE RATE 5½%
Determined as of September 30, 1981

Definition

The Loan Use Charge Rate is Nuexco's judgment of the annual interest rate at which uranium loans could be concluded as of the last day of the month.

Derivation

Nuexco bases the Loan Use Charge Rate upon:

A. Data from recently completed or pending loan transactions.

B. Rates included in firm proposals to borrow or lend.

C. Rates that potential borrowers and lenders have expressed as a willingness to pay or accept, but for which Nuexco is not aware of firm proposals.

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STATISTICAL DATA

CURRENT TRANSACTIONS*

Uranium Transactions

Nuexco Reference Number	Delivery Period	Approximate Quantity (thousands of pounds, U_3O_8 equivalent)	Approximate Price as percent of Current E.V.	Seller Group	Buyer Group	Remarks
1456	1981-86	2001-4000	–	Canada	US	Formula Price
1613	1981	Less than 50	97	US	US	
1615	1981	Less than 50	95	US	US	
1616	1982-88	4001-6000	–	Australia	Europe	Price related to market
1618	1981	101-300	98	US	US	

Conversion Transactions

Nuexco Reference Number	Delivery Period	Approximate Quantity (thousands of pounds, U equivalent)	Approximate Price as percent of Current C.V.	Seller Group	Buyer Group	Remarks
1619	1981	601-1000	91	US	Non-US	

*Transactions listed include not only those in which Nuexco was involved, but also all others of which Nuexco is aware.

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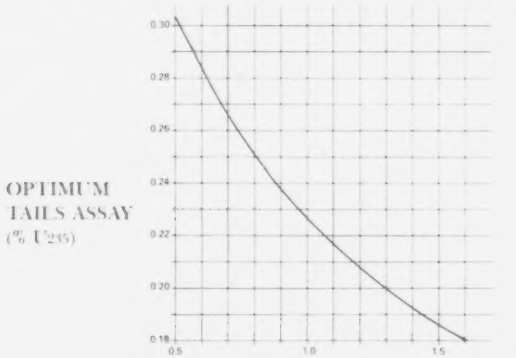
OPTIMUM TAILS ASSAY

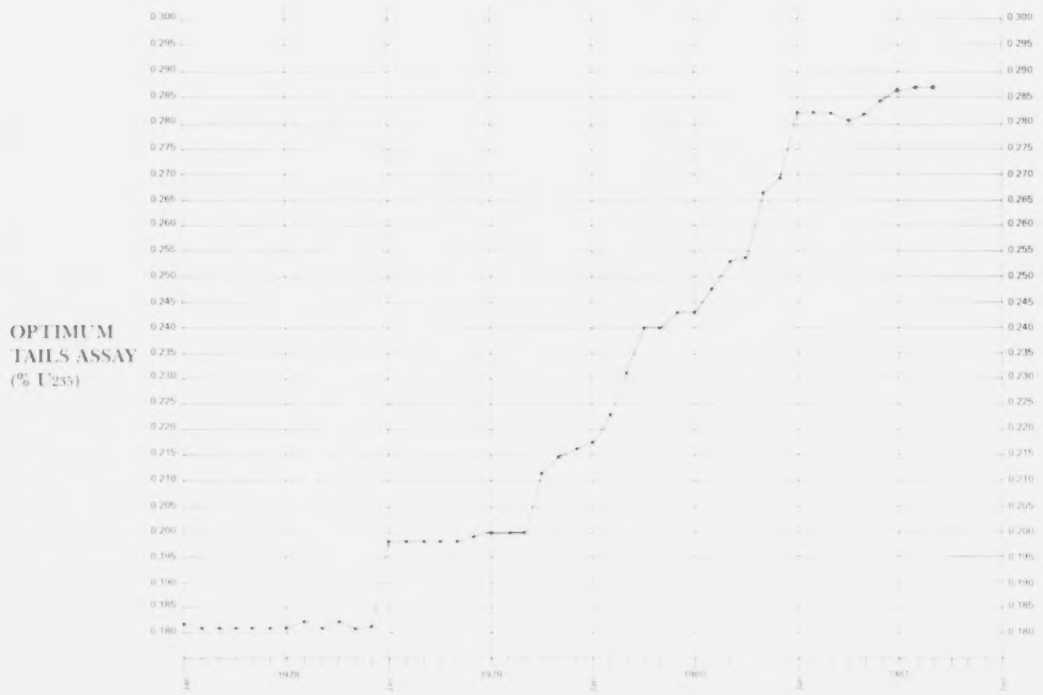
The optimum tails assay is the tails composition at which the cost of enriched uranium is lowest for given costs of separative work (SWU) and natural uranium feed. It depends only on the ratio of the cost of a kilogram of natural uranium in the form of UF_6 to the cost of a kilogram unit of separative work. The US Department of Energy (USDOE) Adjustable Fixed Commitment (AFC) enrichment contract holders have the option, within limits, to specify the transaction tails assay. The transaction tails assay for USDOE Requirements contracts is 0.2 percent U_{235}. For every one-hundredth of one percent increase in the transaction tails assay, uranium consumption increases about two percent.

TAILS ASSAY FOR MINIMUM COST OF PRODUCT*



*From Nuexco Report 138

OPTIMUM TAILS ASSAY[1]



[1]Based on Exchange Value and USDOE AFC SWU price; interpolated to the nearest thousandth.

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STATISTICAL DATA

US GOVERNMENT STATISTICS

	Producer Price Index—Industrial Commodities (1967 = 100)[1]	Producer Price Index—All Commodities (1967 = 100)[1]	Consumer Price Index (1967 = 100)[2]	GNP Implicit Price Deflator (1972 = 100)[3]	Gross Average Hourly Earnings of Production or Non-supervisory Workers (US$)[4]			
					Metal Mining (SIC 10)	Primary Non-ferrous Metals (SIC 333)	Chemicals and Allied Products (SIC 28)	Electric and Electronic Equipment (SIC 36)
Ann. Avg. 1970[5]	110.0	110.4	116.3	91.36	3.88	3.87	3.69	3.28
Ann. Avg. 1971[5]	114.1	114.0	121.3	96.02	4.12	4.15	3.97	3.49
Ann. Avg. 1972[5]	117.9	119.1	125.3	100.00	4.56	4.59	4.26	3.71
Ann. Avg. 1973[5]	125.9	134.7	133.1	105.80	4.84	4.98	4.51	3.91
Ann. Avg. 1974[5]	153.8	160.1	147.7	116.02	5.44	5.63	4.88	4.21
Ann. Avg. 1975[5]	171.5	174.9	161.2	127.15	6.13	6.24	5.39	4.64
Ann. Avg. 1976[5]	182.4	183.0	170.5	133.71	6.76	6.87	5.91	4.96
Ann. Avg. 1977[5]	195.1	194.2	181.5	141.70	7.28	7.67	6.43	5.39
Ann. Avg. 1978[5]	209.4	209.3	195.4	152.05	8.23	8.56	7.02	5.82
Ann. Avg. 1979[5]	236.5	235.6	217.4	165.46	9.27	9.50	7.60	6.32
Ann. Avg. 1980[5]	274.8	268.8	246.8	177.36	10.27	10.63	8.30	6.95
May 1980	271.9	264.2	244.9	–	10.19	10.38	8.18	6.77
Jun 1980	273.5	265.6	247.6	178.93	10.14	10.70	8.25	6.86
Jul 1980	276.2	270.4	247.8	–	10.24	10.83	8.36	6.95
Aug 1980	278.2	273.8	249.4	–	10.39	10.79	8.40	7.01
Sep 1980	278.8	274.6	251.7	182.92	10.55	10.95	8.47	7.12
Oct 1980	282.2	277.8	253.9	–	10.59	11.01	8.53	7.18
Nov 1980	283.4	279.1	256.2	–	10.73	11.07	8.60	7.27
Dec 1980	286.6	280.8	258.4	183.98	10.84	11.32	8.69	7.38
Jan 1981	291.5	284.8	260.5	–	10.91	11.31	8.74	7.41
Feb 1981	295.7	287.6	263.2	–	11.15	11.36	8.80	7.43
Mar 1981	299.6	290.3	265.1	188.14	11.13	11.50	8.84	7.47
Apr 1981	303.5R	293.4	266.8	–	11.30	11.63	8.94	7.51
May 1981	304.1	293.7	269.0	–	11.26	11.68	8.99	7.55
Jun 1981	304.7	294.5	271.3	191.17	11.31	11.88	9.07	7.60
Jul 1981	306.0P	296.0P	274.4	–	11.63P	12.13P	9.14P	7.71P
Aug 1981	307.0P	296.2P	276.5P	–	–	–	9.22P	7.88P

P = Preliminary R = Revised since last month

(1) US Bureau of Labor Statistics, Washington, D.C.; "Producer Prices and Price Indexes," Table 6 (formerly "Wholesale Prices and Price Indexes"). Producer Price Indexes are revised four months after they are first released to reflect the availability of late reports and corrections by respondents.

(2) US Bureau of Labor Statistics, Washington, D.C.; Consumer Price Index for All Urban Consumers, US City Average, All Items.

(3) US Department of Commerce, Washington, D.C.; Bureau of Economic Analysis, National Income and Wealth Division; "Survey of Current Business," Table A. The GNP Implicit Price Deflator is published quarterly, and seasonally adjusted.

(4) US Bureau of Labor Statistics, Washington, D.C.; "Employment and Earnings," Table C-2. All data based on 1972 revision of SIC Manual. Data for 1970-1976 are adjusted to the March 1977 benchmark. Data for 1977-1978 are adjusted to the March 1979 benchmark. Data for January 1979 and beyond are adjusted to the March 1980 benchmark.

(5) Monthly data 1970-1978 for Producer Price Index-Industrial Commodities, Consumer Price Index, and Employment and Earnings SIC codes 10, 333, and 28, and quarterly data for GNP Implicit Price Deflator appear on pages 4.6-4.8 of Nuexco Report 139.
Monthly data 1977-1978 for Employment and Earnings SIC Codes 10, 333, and 28 appear on page 33 of Nuexco Report 147.
Monthly data 1970-1978 for Employment and Earnings SIC Code 36 appear on page 23 of Nuexco Report 154.
Monthly data 1979-1980 for Employment and Earnings, Revised Establishment Data, all listed codes, appear in this report.
Monthly data 1977-1980 for Producer Price Index-All Commodities, appear in this report.

STATISTICAL DATA

US GOVERNMENT STATISTICS

Producer Price Index
All Commodities (1)
(1967 = 100)

Month	1980	1979	1978	1977
Jan	254.9	220.8	200.1	188.1
Feb	260.2	224.1	202.1	190.2
Mar	261.9	226.7	230.0	206.5
Apr	262.8	230.0	232.0	208.0
May	264.2	232.0	208.0	195.2
Jun	265.6	233.5	209.6	194.5
Jul	270.4	236.9	210.7	194.8
Aug	273.8	238.3	210.6	194.6
Sep	274.6	242.0	212.4	195.3
Oct	277.8	245.6	214.9	196.3
Nov	279.1	247.2	215.7	197.1
Dec	280.8	249.7	217.5	198.2
Ann. Avg.	268.8	235.6	209.3	194.2

(1) US Bureau of Labor Statistics, Washington, D.C.: "Producer Prices and Price Indexes," Table 6 (formerly "Wholesale Prices and Price Indexes").

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STATISTICAL DATA

US GOVERNMENT STATISTICS

Metal Mining (SIC 10)

Month	1980	1979
Jan	9.92	8.71
Feb	9.93	8.81
Mar	9.91	8.85
Apr	10.01	9.03
May	10.19	9.06
Jun	10.14	9.09
Jul	10.24	9.33
Aug	10.39	9.39
Sep	10.55	9.63
Oct	10.59	9.67
Nov	10.73	9.79
Dec	10.84	9.81
Ann. Avg.	10.27	9.27

Primary Non-ferrous Metals (SIC 333)

Month	1980	1979
Jan	10.06	9.00
Feb	10.02	9.01
Mar	10.24	9.11
Apr	10.31	9.49
May	10.38	9.14
Jun	10.70	9.44
Jul	10.83	9.57
Aug	10.79	9.70
Sep	10.95	9.79
Oct	11.01	9.87
Nov	11.07	9.86
Dec	11.32	9.92
Ann. Avg.	10.63	9.50

Chemicals and Allied Products (SIC 28)

Month	1980	1979
Jan	7.98	7.33
Feb	8.01	7.33
Mar	8.06	7.37
Apr	8.13	7.52
May	8.18	7.48
Jun	8.25	7.54
Jul	8.36	7.61
Aug	8.40	7.66
Sep	8.47	7.74
Oct	8.53	7.83
Nov	8.60	7.89
Dec	8.69	7.93
Ann. Avg.	8.30	7.60

Electric and Electronic Equipment (SIC 36)

Month	1980	1979
Jan	6.66	6.12
Feb	6.70	6.14
Mar	6.76	6.17
Apr	6.78	6.12
May	6.77	6.22
Jun	6.86	6.26
Jul	6.95	6.28
Aug	7.01	6.36
Sep	7.12	6.46
Oct	7.18	6.48
Nov	7.27	6.51
Dec	7.38	6.63
Ann. Avg.	6.95	6.32

(1) US Bureau of Labor Statistics, Washington, D.C.; Supplement to Employment and Earnings Revised Establishment Data, August 1981.

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STATISTICAL DATA

AUSTRALIAN GOVERNMENT STATISTICS

	Price Index of Materials Used in Manufacturing Industry—All Groups (Year 1968-69 = 100.0)[1]	Weighted Average Minimum Weekly Wage Rates—Adult Males Australia Mining and Quarrying (A$)[2]
Annual Avg. 1970[3]	101.4	59.88
Annual Avg. 1971[3]	101.5	65.95
Annual Avg. 1972[3]	105.6	71.26
Annual Avg. 1973[3]	124.4	78.96
Annual Avg. 1974[3]	141.9	108.07
Annual Avg. 1975[3]	150.4	132.55
Annual Avg. 1976[3]	168.4	160.93
Annual Avg. 1977[3]	192.0	179.03
Annual Avg. 1978[3]	198.5	190.04
Annual Avg. 1979	248.8	196.34
Annual Avg. 1980	321.8	217.96
May 1980	335.6	214.81
Jun 1980	338.8	214.16
Jul 1980	347.8	221.51
Aug 1980	352.0	220.08
Sep 1980	350.3	219.60
Oct 1980	348.2	221.13
Nov 1980	350.4	221.49
Dec 1980	351.7	221.81
Jan 1981	357.8	229.96
Feb 1981	356.6	229.79
Mar 1981	355.2	229.03
Apr 1981	354.6	228.75
May 1981	353.4	236.67
Jun 1981	360.4P	236.98
Jul 1981	357.5P	236.84P

P = Preliminary R = Revised since last month

(1) Australian Bureau of Statistics, Canberra: "Price Index of Materials Used in Manufacturing Industry" (Catalogue No. 6411.0), Table 3.
(2) Australian Bureau of Statistics, Canberra: "Wage Rates, Australia" (Catalogue No. 6312.0), Table 1. Figures for the latest fourteen months shown are subject to revision.
(3) Monthly data for 1970 through 1978 appear on pages 4.7 and 4.8 of Nuexco Report 138.

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CANADIAN GOVERNMENT STATISTICS

	Industry Selling Price Index: Manufacturing (D 500000)[1,2] (1971 = 100.0)	Wage-earner Data: Average Hourly Earnings (C$)[3,4]		
		Metal Mining, including milling (SIC 050-059)	Primary Metal Industries, non-ferrous (SIC 296-298)	Chemicals and Chemical Products (SIC 370-379)
Annual Avg. 1977	174.3	8.18	6.50	6.51
Annual Avg. 1978	190.4	8.76	6.82	6.97
Annual Avg. 1979	217.9	9.60	7.35	7.67
Annual Avg. 1980	247.2	10.59	8.05	8.50
May 1980	242.2	10.50	8.01	8.44
Jun 1980	243.7	10.51	8.07	8.46
Jul 1980	246.3	10.49	8.11	8.55
Aug 1980	249.4	10.58	8.14	8.65
Sep 1980	252.0	10.85	8.24	8.71
Oct 1980	256.0	11.05	8.28	8.82
Nov 1980	257.8R	11.11	8.38	8.77
Dec 1980	258.4	11.13	8.32	8.92
Jan 1981	263.3	11.27	8.51	8.90
Feb 1981	263.6	11.43	8.59	9.00
Mar 1981	265.4	11.47	8.63	9.17
Apr 1981	267.7	11.73	8.76	9.33
May 1981	269.6	11.82P	8.90P	9.49P
Jun 1981	271.9	11.67P	9.21P	9.60P
Jul 1981	273.1P	—	—	—

P = Preliminary R = Revised since last month

(1) Statistics Canada, Prices Division, Ottawa: "Industry Price Indexes" (Catalogue 62-011), Table 1. Indexes for the most recent six months shown are subject to revision.

(2) Monthly data for 1973 through 1978 appear on page 4.10 of Nuexco Report 138.

(3) Statistics Canada, Labour Division, Employment and Payrolls Section, Ottawa: "Employment, Earnings and Hours" (Catalogue 72-002), Table 2.

(4) Monthly data for 1977 and 1978 appear on page 4.11 of Nuexco Report 138.

STATISTICAL DATA

REPUBLIC OF SOUTH AFRICA STATISTICS

	Average Declared Working Costs per Metric Ton of Gold Ore Milled (Rand)[1]	Consumer Price Index[2] (1975 = 100, except where otherwise indicated)	Wholesale Price Index All Groups (1975 = 100)	Total Employment in Mining and Quarrying (Code 35)[5]	Total Salaries and Wages in Mining and Quarrying (1,000 Rand) (Code 40)[5]
Annual Avg. 1970[3]	7.34	100.3[4]		655,346	399,164
Annual Avg. 1971[3]	7.88	106.4[4]	59.1	652,294	415,956
Annual Avg. 1972[3]	8.79	113.3[4]	63.9	623,067	443,933
Annual Avg. 1973[3]	10.51	124.1[4]	72.3	684,743	572,133
Annual Avg. 1974[3]	13.18	138.5[4]	85.3	674,140	761,596
Annual Avg. 1975[3]	16.71	157.2[4]	100.0	639,473	1,003,617
Annual Avg. 1976[3]	19.30	174.7[4]	115.1	671,240	1,212,983
Annual Avg. 1977[3][6]	23.87	194.4[4]	130.0	712,006	1,420,670
Annual Avg. 1978[3][6]	27.14	137.2	142.7	664,571	1,537,169
Annual Avg. 1979[3][6]	30.18	155.3	164.5	692,209	1,830,632
Annual Avg. 1980[6]	35.53	176.7	192.1	714,379	2,279,615
May 1980	–	171.9	187.0	717,171	179,128
Jun 1980	34.48	174.6	189.0	714,379	183,739
Jul 1980	–	177.2	192.7	715,460	202,403
Aug 1980	–	179.2	196.8	716,486	206,514
Sep 1980	36.19	182.8	199.8	710,889	204,761
Oct 1980	–	186.3	203.1	720,246	204,602
Nov 1980	–	187.8	205.6	716,797	208,345
Dec 1980	37.69	189.9	206.5	705,087	211,829
Jan 1981	–	191.0	207.2	729,575	219,969
Feb 1981	–	193.8	209.8	725,647	210,275
Mar 1981	39.26	195.2	209.9	705,010	210,151
Apr 1981	–	196.4	211.6	719,674	217,124
May 1981	–	197.7	213.2	726,869	219,880
Jun 1981	40.41	200.0	215.3	728,506	237,049
Jul 1981	–	204.6	218.4	–	–
Aug 1981		208.0	222.6	–	–

(1) Chamber of Mines of South Africa, Johannesburg; "Analysis of Working Results," published quarterly.
(2) Republic of South Africa Department of Statistics, Pretoria; "Government Gazette: Consumer Price Index for Urban Areas."
(3) Historical data for the Average Declared Working Costs and Consumer Price Index 1970-1979 appear on page 19 of Nuexco Report 140.
(4) April 1970 = 100.00.
(5) Bulletin of Statistics, Department of Statistics, Pretoria.
(6) Historical data for Codes 35 and 40 1977-1980 appear on page 28 of Nuexco Report 157.

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MARKET OPPORTUNITIES

Market Opportunities are *active* inquiries in the uranium market to buy, sell, borrow or lend. The data presented in this section are in no way intended to be indicative of the entire uranium market for the time period covered.

URANIUM SUPPLY

Nuexco Reference Number	Delivery Period* (Thousands of Pounds U_3O_8) 0 to 1 Year	1 to 2 Years	2 to 3 Years	Remarks
Available for Sale:				
1393			350	
1475	1100			UF_6
1480	150	300	300	
1490	1100			
1575			500	Long Term
1589	350			
1581	100	150	150	Long Term
1600			200	Long Term
1610	300	300		
1637	500	500		
1678		275		
1684	500			
1685	100			
1698	70			
1713	50			UF_6
1727	500			
1738	750			UF_6
1741	500			
1743	100	100	100	Long Term
1745	200			
1749	350			
1770	700	800		
TOTAL:	7420	2425	1600	
Available for Loan:				
1429	300			UF_6
1646	275	275	275	
1695	225	325	325	UF_6
1742	500			
TOTAL:	1300	600	600	

*Measured from the date of this Report.

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MARKET OPPORTUNITIES

Market Opportunities are *active* inquiries in the uranium market to buy, sell, borrow or lend. The data presented in this section are in no way intended to be indicative of the entire uranium market for the time period covered.

URANIUM DEMAND

Nuexco Reference Number	Delivery Period* (Thousands of Pounds U_3O_8) 0 to 1 Year	1 to 2 Years	2 to 3 Years	Remarks
Inquiries to Purchase:				
1459			200	Long Term
1462			100	Long Term
1603		100	100	Long Term
1634	400	400		
1699	950	300	250	
1704		200	200	Long Term
1724	600	500	500	Long Term
1732	50			
1744	1000			
1762	450			
1769	125			UF_6
1771	500			
TOTAL:	4075	1500	1350	
Inquiries to Borrow:				
1621	300			
TOTAL:	300			

*Measured from the date of this Report.

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MARKET OPPORTUNITIES

Market Opportunities are *active* inquiries in the secondary market for UF_6 conversion services. The data presented in this section are in no way intended to be indicative of the entire market for the time period covered.

CONVERSION SUPPLY

Nuexco Reference Number	Delivery Period* (Thousands of Pounds U as UF_6)			Remarks
	0 to 1 Year	1 to 2 Years	2 to 3 Years	
1451	75			
1607	900			
1609	500	1500	1000	Long Term
1619		200	100	
1661		200	200	Long Term
1684	450			
1764	100			
TOTAL:	2025	1900	1300	

CONVERSION DEMAND

Nuexco Reference Number	Delivery Period* (Thousands of Pounds U as UF_6)			Remarks
	0 to 1 Year	1 to 2 Years	2 to 3 Years	
1594		400	950	Long Term
1622		400	400	Long Term
TOTAL:		800	1350	

*Measured from the date of this Report.

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